

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS

CONSOLIDATED UNDER
CASE NO. 05-10155 PBS

YISEL DEAN, Independent Administratrix of the Estate of
STEVEN DEAN, deceased, and on behalf of all statutory
beneficiaries,
Plaintiff,

V.

DOCKET NO: 05cv10155 PBS

RAYTHEON COMPANY, a Delaware corporation,
RAYTHEON AIRCRAFT COMPANY, a Kansas Corporation,
RAYTHEON AIRCRAFT CREDIT CORPORATION, a
Kansas Corporation, COLGAN AIR, INC., a Virginia
Corporation d/b/a US Air
Express,
Defendants.

LISA A. WEILER, Administratrix of the Estate of SCOTT A. KNABE, deceased, and on behalf of all statutory beneficiaries,
Plaintiff,

V.

DOCKET NO: 05cv10364 PBS

RAYTHEON COMPANY, a Delaware corporation,
RAYTHEON AIRCRAFT COMPANY, a Kansas Corporation,
RAYTHEON AIRCRAFT CREDIT CORPORATION, a
Kansas Corporation, COLGAN AIR, INC., a Virginia
Corporation d/b/a US Air Express,
Defendants.

DEFENDANTS' MOTION TO DISQUALIFY PLAINTIFFS' EXPERT JOHN GOGLIA

NOW COME the defendants and hereby move the Court for an order disqualifying plaintiffs' expert, John Goglia. Defendants have filed an accompanying Memorandum of Law in support of this motion.

I hereby certify that this document(s) filed through the ECF system will be sent electronically to the registered participants as identified on the Notice of Electronic Filing (NEF) and paper copies will be sent to those indicated as non registered participants on January 19, 2007.

/s/ Tory A. Weigand

RAYTHEON DEFENDANTS,
By Counsel,

/s/ Tory A. Weigand

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EXHIBIT “1”


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National Transportation Safety Board FACTUAL REPORT AVIATION		NTSB ID: NYC03MA183		Aircraft Registration Number: N240CJ	
		Occurrence Date: 08/26/2003		Most Critical Injury: Fatal	
		Occurrence Type: Accident		Investigated By: NTSB	
Location/Time					
Nearest City/Place Yarmouth	State MA	Zip Code 02675	Local Time 1540	Time Zone EDT	
Airport Proximity: Off Airport/Airstrip		Distance From Landing Facility: 4		Direction From Airport: 180	
Aircraft Information Summary					
Aircraft Manufacturer Beech		Model/Series 1900D		Type of Aircraft Airplane	
Sightseeing Flight: No			Air Medical Transport Flight: No		
Narrative					
<p>Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:</p> <p>HISTORY OF FLIGHT</p> <p>On August 26, 2003, at 1540 eastern daylight time, a Beech 1900D, N240CJ, operated by Colgan Air Inc. as flight 9446 (d.b.a. US Airways Express), was destroyed when it impacted water near Yarmouth, Massachusetts. The certificated airline transport pilot and certificated commercial pilot were fatally injured. Visual meteorological conditions prevailed for the flight that departed Barnstable Municipal Airport (HYA), Hyannis, Massachusetts; destined for Albany International Airport (ALB), Albany, New York. An instrument flight rules flight plan was filed for the repositioning flight conducted under 14 CFR Part 91.</p> <p>According to data from Federal Aviation Administration (FAA) air traffic control (ATC), the flight departed runway 24 at Hyannis about 1538. Shortly after takeoff, the flightcrew declared an emergency and reported a "runaway trim." The airplane flew a left turn and reached an altitude of approximately 1,100 feet. The flightcrew subsequently requested to land on runway 33, and the air traffic control tower (ATCT) controller cleared the flight to land on any runway. No further transmissions were received from the flightcrew.</p> <p>Witnesses observed the airplane in a left turn, with a nose-up attitude. The airplane then pitched nose-down, and impacted the water "nose first."</p> <p>According to the cockpit voice recorder (CVR), the flightcrew completed the Before Start checklist between 1523 and 1530; however, there was no record of the First Flight Of The Day checklist being completed after engine start.</p> <p>At 1523:30, the captain called for the Before Start checklist.</p> <p>At 1523:43, the first officer stated, "preflight's complete. cockpit scan complete." The captain replied, "complete."</p> <p>At 1523:58, the first officer stated, "maintenance log, release, checked the aircraft." The captain replied, "uhhhh. maintenance and release on aircraft. The captain subsequently identified that the DFDR was inoperative, and confirmed that the minimum equipment list (MEL) was still open.</p> <p>At 1525:11, the captain began to start the right engine, before being interrupted. Approximately 1 minute later, after a conversation with maintenance personnel over the radio, the captain resumed the starting of the right engine.</p> <p>At 1529:29, as the captain was starting the left engine, the flightcrew began non-pertinent conversation, which lasted about 30 seconds.</p>					
FACTUAL REPORT - AVIATION					


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<p>At 1530:04, the captain called for the After Start checklist. After completing the After Start checklist items, the first officer announced the checklist "complete."</p> <p>At 1530:21, the captain continued the previous non-pertinent conversation, followed 10 seconds later with, "all right we're ready to taxi with HOTEL."</p> <p>At 1530:50, the flightcrew began a conversation about the flight plan to ALB, taxiing the airplane, and which pilot would fly the airplane. The conversation lasted for about 4 minutes.</p> <p>At 1535:14, during the Taxi checklist, the first officer stated, "...three trims are set." The first officer then called the Taxi checklist "complete."</p> <p>At 1535:26, the flight crew began a non-pertinent discussion about a landing airplane. The discussion lasted about 1 minute and 27 seconds.</p> <p>At 1537:00, the airplane was holding short of runway 24.</p> <p>At 1537:17, the captain stated, "all right. forty six is ready." The flightcrew then began to announce several items, which were identified as being on the Before Takeoff checklist; however, the checklist was not called for.</p> <p>At 1538:07, the controller cleared Colgan flight 9446 for takeoff on runway 24.</p> <p>At 1538:08, the flightcrew initiated a takeoff on runway 24.</p> <p>At 1538:40, the first officer stated "V1...rotate."</p> <p>At 1538:46, the captain stated, "...we got a hot trim..." At that time, according to the digital flight data recorder (DFDR), the elevator trim moved from approximately -1.5 degrees (nose down) to -3 degrees at a speed consistent with the electric trim motor.</p> <p>At 1538:48, the captain stated, "kill the trim kill the trim kill the trim."</p> <p>At 1538:50, the captain stated, "roll back...roll back roll back roll back roll back." According to the DFDR, the elevator trim then moved from approximately -3 degrees to -7 degrees at a speed greater than the capacity of the electric trim motor.</p> <p>At 1538:56, the captain stated, "roll it back roll my trim..."</p> <p>At 1539:00, the captain stated, "do the electric trim disconnect..."</p> <p>At 1539:04, the captain instructed the first officer to, "go on the controls" with him.</p> <p>At 1539:14, the captain instructed the first officer to retract the landing gear.</p> <p>At 1539:18, the captain instructed the first officer to retract the flaps. The first officer responded that they were "up."</p> <p>At 1539:21, the captain declared an emergency regarding a runaway trim and requested to return to the airport. The controller acknowledged the emergency and offered the option of the left or right downwind for runway 24.</p> <p>At 1539:33, the captain instructed the first officer to reduce the engine power.</p> <p>From 1539:49 to 1540:03, the captain instructed the first officer to "pull the breaker." The first</p>		
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<p>officer queried the captain as to its location.</p> <p>At 1540:30, the captain requested to land on runway 33. The controller acknowledged the transmission and cleared the flight to land on runway 33.</p> <p>The recording ended at 1540:47.</p> <p>The accident occurred during the hours of daylight; located approximately 41 degrees, 37 minutes north longitude, and 70 degrees, 15 minutes west latitude.</p> <p>PERSONNEL INFORMATION</p> <p>Captain</p> <p>The captain held an airline transport pilot certificate, with a rating for airplane multiengine land, and was type rated in the Beech 1900D. His most recent FAA first class medical certificate was issued on March 18, 2003. The captain was hired by Colgan Air on July 16, 2001, and initially flew as a first officer on the Beech 1900D. He received a Beech 1900D type rating on January 8, 2003. The captain's most recent proficiency check was completed on June 5, 2003. The captain had accumulated a total flight time of 2,891 hours; of which, 451 hours were as pilot in command of a Beech 1900D, and 913 hours were as second in command of a Beech 1900D.</p> <p>First Officer</p> <p>The first officer held a commercial pilot certificate with ratings for airplane single engine land, airplane multiengine land, and instrument airplane. His most recent FAA first class medical certificate was issued on August 22, 2003. The first officer was hired by Colgan Air on October 22, 2002, and assigned to the Beech 1900D. His most recent proficiency check was completed on November 3, 2002. The first officer had accumulated a total flight time of 2,489 hours; of which, 689 hours were in a Beech 1900D.</p> <p>Quality Assurance Inspector</p> <p>The quality assurance inspector received an airframe and powerplant certificate in 1986. He worked for several companies within the aviation industry and was hired by Colgan Air in June, 2002. The quality assurance inspector had no prior experience on the Beech 1900 before his employment at Colgan Air. He received 40 hours of formal training for the Beech 1900, and on the job (OJT) training as well.</p> <p>Lead Maintenance Technician</p> <p>The lead maintenance technician that replaced the elevator trim tab cable received his airframe and powerplant certificate in September, 2001. He was hired by Colgan Air on October 2, 2001. He received approximately 94.5 hours of formal training on the Beech 1900, and OJT. The lead maintenance technician had previously replaced a forward elevator trim tab cable on a Beech 1900C with a former employer.</p> <p>Lead Maintenance Technician</p> <p>The second lead maintenance technician that assisted in replacing the elevator trim tab cable received his airframe and powerplant certificate in September, 2001. He was hired by Colgan Air on October 2, 2001. He received approximately 72 hours of formal training on the Beech 1900, and OJT.</p>		
AIRCRAFT INFORMATION		
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<p>The airplane was manufactured in 1993, and equipped with two Pratt & Whitney PT6A engines. On January 3, 2003, Colgan Air leased the airplane from Raytheon Aircraft Credit Corporation, and it entered service on January 4, 2003.</p> <p>At the time of the accident, the airplane had accumulated 16,503.5 hours of operation; of which, 1,219.1 hours were generated by Colgan Air. The airplane had accumulated a total of 24,637 cycles; of which, 1,765 cycles were generated by Colgan Air. The left engine had accumulated 15,245 total hours of operation, and 3,120 hours since the last overhaul. The right engine had accumulated 16,180 total hours of operation, and 3,120 hours since the last overhaul.</p> <p>The accident flight was the first flight after maintenance had been performed on the airplane, which included replacement of the forward elevator pitch trim tab cable.</p> <p>METEOROLOGICAL INFORMATION</p> <p>At 1556, the reported weather at HYA was: winds variable at 6 knots; visibility 10 miles; sky clear; temperature 78 degrees Fahrenheit; dew point 68 degrees Fahrenheit; altimeter 29.86 inches of mercury.</p> <p>FLIGHT RECORDERS</p> <p>Cockpit Voice Recorder</p> <p>The airplane was equipped with a Fairchild model A-100A CVR. The CVR was transported to the NTSB, Office of Research and Engineering, on August 27, 2003. A CVR group convened on August 28, 2003, and a transcript was prepared of 17 minutes 17 seconds of the approximate 34-minute recording. Recordings prior to the flightcrew entering the cockpit were not transcribed.</p> <p>According to the CVR Group Chairman's report, the exterior of the CVR showed evidence of structural damage. The interior of the recorder and the tape were found intact and in good condition. The recording consisted of four channels of "poor to good" quality audio information.</p> <p>Flight Data Recorder</p> <p>The airplane was equipped with a L3COM (Fairchild) Model F1000 (S/N 00505) DFDR. The DFDR was transported to the NTSB Office of Research and Engineering on August 27, 2003. A DFDR readout was then performed.</p> <p>The DFDR recorded data in a digital format using solid-state Flash Memory as the recording medium. Although the recorder was damaged by impact forces, the memory module was not damaged. The timing of the DFDR data was correlated to air traffic control and CVR timing.</p> <p>A total of 96.7 hours of data on the DFDR was referenced to compare previous flights to the accident flight. As a result of the recent maintenance performed on the airplane, the pitch trim values and elevator position values for the DFDR were out of calibration, and the DFDR was noted as inoperative on the maintenance records. However, the DFDR recorded data for the accident flight. Although the exact pitch trim and elevator position values were not known, the data provided trend information.</p> <p>There was no DFDR data recovered that indicated an operational check of the elevator trim system was performed after maintenance. However, the DFDR required 115 volts of AC current to operate. The electric trim system could operate using the 28-volt DC bus, without having the 115-volt AC bus powered.</p>		
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The DFDR values recorded for the pitch trim control position, at the beginning of the flight, were approximately 2 degrees negative. Shortly after takeoff, the pitch trim control values changed to approximately 3 degrees negative, where they remained for a period of about 10 seconds. The pitch trim control values then moved to approximately 7 degrees negative, where they remained for the duration of the flight. The data also revealed that after takeoff, the airspeed continued to increase to approximately 210 knots, and then to 250 knots during the descent.

The digital flight data recorded (DFDR) indicated that shortly after declaring an emergency, the airplane began a left turn while climbing to 1,100 feet. Engine torque was reduced, and the airplane remained at 1,100 feet while maintaining an airspeed of approximately 207 knots and 30 degrees of left bank for 15 seconds. The airplane then pitched down to 8 degrees negative (nose down) and the airspeed increased to 218 knots. The airplane rolled right and left due to control inputs, and the pitch attitude decreased to 30 degrees negative.

AIRCRAFT PERFORMANCE

A performance study was completed to evaluate radar and DFDR data. For the purpose of the study, the un-calibrated DFDR values were corrected to known values during ground operations, and assumed values during the accident flight.

Specifically, the elevator pitch trim was shifted 2.07 degrees nose-up based on a maximum nose down value of approximately -5 degrees, rather than -7 degrees.

The performance study was completed in conjunction with a DFDR study. They revealed that during the takeoff roll, the elevator did not leave the trailing edge down stop as soon, and did not move in the trailing edge up direction as rapidly, as during previous takeoffs. A kinematics extraction revealed that approximately 60 pounds of control column pull force was required immediately after rotation, which was greater than previous flights.

Once airborne, the airplane performance was consistent with the elevator pitch trim moving to the full nose down position. The airplane climbed to approximately 1,100 feet msl, before descending into the water. As the airspeed exceeded 200 knots during the flight, and approached 250 knots during the descent, the control column forces increased to approximately 250 pounds.

WRECKAGE INFORMATION

The investigative team arrived near the accident scene on August 26 and 27, 2003. The airplane came to rest in approximately 18 feet of water, about 300 feet from the Yarmouth shore. The majority of the wreckage, including both engines, was recovered on August 28. The team examined wreckage, operational records, maintenance records, and DFDR data on-scene from August 27 through August 31.

The left engine exhibited impact and salt-water immersion damage. The engine was recovered stripped of the cowlings, right engine mount, and right exhaust stub. The shroud and guide vane inner and outer drums were circumferentially scored at the second stage power turbine. The first stage compressor blades were bent forward and opposite the direction of rotation, and the shroud exhibited circumferential scoring.

The right engine exhibited impact and salt-water immersion damage. The engine was recovered with some portions of the cowlings attached. The shroud and guide vane inner and outer drums were circumferentially scored at the second stage power turbine. The first stage compressor blades were bent forward and opposite the direction of rotation, and the shroud exhibited circumferential scoring.

Portions of both wings, the cockpit, and fuselage were recovered, and exhibited impact damage. The

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empennage was recovered partially intact. Approximately all of the right elevator was recovered, except for the outboard edge. The inboard portion of the right elevator remained attached to the horizontal stabilizer at the two inboard hinge locations. About 5 feet of the left elevator was recovered, and attached at one inboard hinge. Both elevator balance weights were recovered. An approximate 7-foot section of left horizontal stabilizer was found intact, and an approximate 5-foot section of right stabilizer spar was visible. The rudder remained attached to the vertical stabilizer.

The right and left elevator trim tabs were found attached to the elevator. The right and left elevator trim actuators were found near the full nose-down elevator trim position. The electric elevator trim servo was found attached to the base of the horizontal stabilizer. The left and right trim tab cables remained wrapped around their respective trim actuator drums. Elevator trim continuity was confirmed from the elevator trim tabs to the cargo door area. Due to fragmentation forward of the cargo door area, trim cable continuity could not be confirmed from the elevator to the cockpit pedestal. However, the cockpit pedestal with elevator trim drum and manual trim wheel was recovered. Further examination of the manual trim wheel revealed that it was found near the 6.5 units of nose-up trim position.

MAINTENANCE

Colgan Air employed its own maintenance technicians that performed all of the necessary scheduled and phase maintenance on its fleet. The fleet was maintained under a continuous airworthiness maintenance program (CAMP), which was developed by Colgan Air and approved by the FAA. The CAMP was a series of checks and inspections, which incorporated guidance from the Beech 1900D airliner maintenance manual (AMM). The various inspections included in the CAMP were: Preflight Inspections, Routine Inspections, Detail Inspections, and Structural Inspections. The Preflight Inspections were due every 4 flight-days, and the Routine Inspections were due every 8 flight-days. The Detail Inspections were divided into six phases, and each phase was performed every 220 flight-hours, which resulted in a completed Detail Inspection after every 1,320 flight hours. The Structural Inspections were set forth by the manufacturer.


Each Detail Inspection focused specifically on a certain part of the airplane. They were: Wings, Powerplant and Nacelles, Flight Compartment/Cabin, Environmental Systems, Landing Gear, and Aft Fuselage/Empennage.

On August 23, 2003, the accident airplane underwent a Detail Six phase check (Aft Fuselage/Empennage). The phase check was interrupted, and the remaining work was deferred on the morning of August 24, per the general maintenance manual (GMM). Ten revenue flight legs were completed that day, and the Detail Six phase check resumed on the evening of August 24, and concluded on August 26.


A maintenance technician conducted a free play check of the left and right elevator trim actuators as part of the Detail Six phase check. Both actuators failed the check, and the failure required replacement of the actuators. During the replacement of the actuators, the technician did not remove the elevators as required by the CAMP and AMM. Additionally, the technician did not maintain pressure on (block) the elevator trim tab cables, nor did the AMM require that the cables be blocked. Subsequently, the cable unwound off the forward drum. On August 25, during the operational check of the system, the forward elevator trim tab cable "fell off" the forward drum, seized, and kinked.

A new forward elevator trim tab cable was ordered. Due to an incorrect right elevator trim actuator part number, a new right elevator trim actuator was also ordered. That evening, two lead maintenance technicians replaced the forward elevator trim tab cable, and two other maintenance technicians replaced the right elevator trim actuator. The forward elevator trim tab cable drum had already been removed by personnel on the dayshift, but no turnover notes were forwarded. The


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<p>AMM and Colgan Air policies did not require turnover notes from one shift to another.</p> <p>The two lead maintenance technicians that replaced the forward elevator trim tab cable did not use a lead wire as instructed by the AMM. They marked the topmost cable pulleys with a "T" instead. A lead maintenance technician and the quality assurance inspector stated that following the maintenance; a successful operational check of the system was completed. They added that the operational check included running the manual and electric elevator trim several times, with the quality assurance inspector at the cockpit and tailbone during different phases of the operational check.</p> <p>The two lead maintenance technicians that installed the new cable stated that they referred to the AMM, and were not confused handling the drum or interpreting the drum illustration.</p> <p>The airplane was returned to service on August 26.</p> <p>Review of the Beech AMM Chapter 27-30-04, "Elevator Trim Tab Cables - Maintenance Practices," revealed that the trim drum was depicted backwards. Although the drum could not be installed backwards, it was possible to mis-route the cable around the drum, and reverse the trim system. The depiction in the maintenance manual showed the nose-up trim tab cable emanating from the aft end of the drum, rather than the forward end. It also showed the nose-down cable emanating from the forward end of the drum, rather than the aft. However, the "FORWARD AS INSTALLED" arrow included in the depiction would have to be ignored, and the cables would have to be crossed once along the cable run, to reverse the system and secure the cable ends into the turnbuckles.</p> <p>Further review of the Beech AMM revealed that there was no procedure for an operational check contained in Chapter 27-30-04. Nor was there a referral to Chapter 27-30-09, "Elevator Trim - Maintenance Practices...Elevator Trim Operational Check;" which did contain a procedure for an operational check of the elevator trim system.</p>		
MEDICAL AND PATHOLOGICAL INFORMATION		
<p>An autopsy was performed on the pilots by The Commonwealth of Massachusetts, Department of Health, Office of the Chief Medical Examiner, Boston, Massachusetts.</p> <p>Toxicological testing was conducted on the pilots at the FAA Toxicology Accident Research Laboratory, Oklahoma City, Oklahoma.</p>		
TESTS AND RESEARCH		
<p>Elevator Trim System</p> <p>The cockpit controls consisted of a manual trim wheel; and two switches on each yoke, which activated an electric elevator trim motor. When moved in the nose up direction, and using "0" as a point of origin, the manual wheel was indexed "0, AFT, 3, FWD, 6, -, UP, -, -, 10, -, UP," and terminated at a white box. When moved in the nose down direction, using "0" as a point of origin, the manual wheel was indexed "0, -, DN, -, 3," and terminated at a white box. The trim wheel connected to a sprocket, driving a chain to a second sprocket, connected to the elevator trim cable drum. The sprockets, chain, and trim drum were located inside the cockpit pedestal. One side of the drum had a slotted side or key way, which connected to the sprocket, and prevented the drum from being installed backwards. The approximate 55-foot long forward elevator trim cable was wrapped around the drum and secured with a cable lock pin.</p> <p>According to a representative from Raytheon Aircraft, the electric trim system could be disconnected in any of four ways: depressing the trim disconnect switch located on each control wheel, moving the ELEV TRIM switch located on the pedestal to the OFF position, pulling the ELEV</p>		
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<p>TRIM circuit breaker, or positioning the BAT, L GEN, R GEN switches to OFF. Additionally, the representative added that the electric trim could be overridden by manually rolling the trim wheel.</p> <p>When the 55-foot cable was routed correctly and wrapped around the drum, it resulted in two approximate equal portions of cable emanating from the trim drum. Both portions of cable proceeded downward below the floor of the cockpit. The nose-up cable portion was the forward cable originating from the drum, and approximately 27 feet 5 inches long. It traveled through sets of pulleys as it proceeded downward, and became the right cable traveling aft underneath the floor of the airplane cabin. The nose-up cable then crossed over a final pulley, becoming the left cable, before mating with the left turnbuckle. The end of the nose-up cable had left hand threads, which screwed into the left hand threads of the left turnbuckle. The left hand threads could not be screwed into the right turnbuckle, as it had right hand threads. The turnbuckles were located near the mid-point of the airplane.</p> <p>The nose-down cable was the aft cable originating from the drum, and approximately 27 feet 2 inches long. It traveled through sets of pulleys as it proceeded downward, and became the left cable traveling aft underneath the floor of the airplane cabin. The nose-down cable then crossed over a final pulley, becoming the right cable, before mating with the right turnbuckle. The end of the nose-down cable had right hand threads, which screwed into the right hand threads of the right turnbuckle. The right hand threads could not be screwed into the left turnbuckle, as it had left hand threads.</p> <p>From the turnbuckles, additional cables continued to travel aft and upward, terminating at the elevator trim actuators, which were attached via pushrods to the elevator trim tabs located at the inboard portion of the right and left elevator. The electric trim motor was installed at the base of the vertical stabilizer, beyond the first set of turnbuckles.</p> <p>On the accident airplane, although the approximate 55-foot elevator trim cable was fragmented due to impact forces, five sections were recovered (assuming that the forward and aft cable emanating from the drum are counted as two sections). Three sections corresponded to the nose-up cable portion, and two sections corresponded to the nose-down cable portion. Cable marks made by the cable lock pin and digital flight data recorder bridle were used for orientation points, as was the intact elevator trim cable removed and replaced before the accident flight. Using those points and the intact elevator trim cable as a reference, the three sections of the nose-up portion of the accident cable measured to within 1.2 inches of the intact cable. However, the three sections resulted in the forward cable emanating from the trim drum terminating in the right turnbuckle, rather than the left turnbuckle (see Airworthiness Group Chairman's Factual Report for more detail and depictions).</p> <p>An approximate 7-foot section of cable, which corresponded to the middle section of the nose-down portion of cable, was not recovered.</p> <p>A mis-rigging demonstration was conducted at Raytheon Aircraft, Wichita, Kansas, on October 14 and 15, 2003. During the demonstration, the manual trim wheel was indexed to "0" when the elevator trim tabs were placed in the neutral position. Although the system was purposely mis-rigged, an operational check of the elevator trim system revealed the error. When the cockpit trim wheel was positioned nose down, the elevator trim tabs moved in a nose-up direction. When the cockpit trim wheel was positioned nose-up, the elevator trim tabs moved in a nose-down direction. When the electric trim motor was activated in one direction, the elevator tabs moved in the corresponding correct direction, but the trim wheel moved opposite of the commanded electric trim direction.</p> <p>The mis-rigging demonstration also revealed that when the manual trim wheel was in the nose-down direction, the trim indicator in the cockpit moved well past the nose down limit, and the trim tabs were in the full nose up position. When the manual trim wheel was moved in the nose-up direction,</p>		
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<p>the trim indicator did not reach the nose up limit. Rather, the indicator stopped near positive "3" units, and the trim tabs were in the full nose down position.</p>		
<p>Flight Simulator</p>		
<p>The Operations Group convened at Flight Safety International, Flushing, New York, on November 25, 2003. Using an FAA certified Level "D" Beech 1900 full motion simulator, the group attempted six simulations of the accident flight. The chief pilot of Colgan Air and an FAA inspector manipulated the controls during the flight simulations.</p>		
<p>During all simulations, the elevator trim was positioned full nose-down shortly after takeoff. The simulator pilot attempted to maintain aircraft control using different power settings to obtain different airspeeds. Five of the six simulations resulted in an uncontrolled descent into terrain.</p>		
<p>On the sixth test, the simulator pilot was able to partially maintain control of the airplane by gradually reducing engine power and maintaining an airspeed of approximately 170 knots. However, he had to return to the airport area at 170 knots, and touchdown at 180 knots. The airplane did not land on a runway, and subsequently impacted terrain.</p>		
<p>ADDITIONAL INFORMATION</p>		
<p>Sterile Cockpit Concept</p>		
<p>Review of the Colgan Air flight operations policy and procedures manual (FOPP), revealed that during the periods of taxiing, takeoff, and altitudes below 10,000 feet indicated, the "flight crewmembers will not participate in any activity which could distract any flight crewmember from the performance of their duties or which could interfere in any way with the proper conduct of those duties." Examples given by the manual, of activities that were to be avoided, included "engaging in non-essential conversations."</p>		
<p>Aircraft Maintenance and Flight Log</p>		
<p>The FOPP also detailed the captain's responsibilities for determining the airworthiness of the airplane. It stated:</p>		
<p>"Review/Verify the Aircraft Maintenance & Flight Log back to the latest valid Airworthiness Release and ensure that all discrepancies between that Airworthiness Release and the current log page are corrected or properly deferred. If the Captain determines that the aircraft status is other than listed on the release, the Captain will inform System Control and correct the inconsistency."</p>		
<p>Review of the Aircraft Maintenance and Flight Log form for the accident flight revealed a discrepancy, which stated, "Flt. Data Recorder needs downloading due to mx. Replacement of Elevator trim cable (Fwd. Most)." The discrepancy was signed by a maintenance technician. The discrepancy was released and signed by the same maintenance technician, in accordance with an approved minimum equipment list, and supporting control number.</p>		
<p>The captain noted to the first officer that the DFDR was an open item on the MEL; however, there is no record of the captain mentioning the replacement of the forward elevator trim cable.</p>		
<p>Checklists</p>		
<p>Review of Colgan Air's Beech 1900 Company Flight Manual revealed that it was FAA approved and contained the expanded normal checklist procedures, as well as abnormal and emergency procedures, and policies; all of which applied to Colgan Air flight operations.</p>		
<p>The manual had specific guidance on the use of normal checklists and procedures, and was to be used</p>		
<p style="text-align: center;">FACTUAL REPORT - AVIATION</p> <p style="text-align: right;">Page 1h</p>		

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 <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p>	NTSB ID: NYC03MA183	
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Narrative (Continued)		
<p>to "ensure all safety items are accomplished." All of the checklists were to be accomplished using a challenge and response method (except for the climb and after landing checklists). The manual also gave guidance in the event that the checklist flow was interrupted. It stated;</p> <p>"Interruptions to checklists increase the possibility of items being missed, which in turn may create hazards to flight operations. When interruptions occur, the crew must give consideration to restarting the checklist from the beginning, taking into consideration such factors as the length and type of interruption."</p> <p>The following checklist excerpts were to have been accomplished by the accident flightcrew. The details of the checklists are focused on the elevator trim system and its related components and systems.</p> <p>Preflight Checklist</p> <p>The Preflight Checklist included, "Elevator, Elevator Tab, Static Wicks (4 each side) - Check & Verify Tabs are in Neutral Position."</p> <p>Before Start Checklist</p> <p>The Before Start Checklist required that the captain review the dispatch release and sign it. He was also required to review the maintenance release and the dispatch release with the first officer.</p> <p>First Flight of the Day Checklist</p> <p>After the engines had been started the checklist required that a "First Flight of the Day" check be performed by the flightcrew. The expanded items of the "Electric Pitch Trim" check included;</p> <p>ELEV TRIM Switch.....ONON Pilot's and Copilot's Trim Switches.....CHECKED</p> <p>1) Pilot's trim will override copilot's trim. 2) Movement of only half switch will not activate trim.</p> <p>Trim Disconnect Switch.....PRESS TO 2ND LEVEL AND RELEASE</p> <p>1) PITCH TRIM OFF Annunciator - ILLUMINATED 2) Electric Pitch Trim - DEACTIVATED</p> <p>ELEV TRIM Switch.....OFF then ON</p> <p>PITCH TRIM OFF Annunciator - EXTINGUISHED</p> <p>Electric Pitch Trim.....SET FOR TAKEOFF</p> <p>Taxi Checklist</p> <p>The expanded items of the Taxi Checklist included;</p>		
<p style="text-align: center;">FACTUAL REPORT - AVIATION</p> <p style="text-align: right;">Page 1i</p>		

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 <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p>	NTSB ID: NYC03MA183	
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Narrative (Continued)		
<p>Trims.....SET</p> <p>Verify proper trim indicator positions (UP 2 Units UC & 3 Units UE, ROLL 0, YAW 0) and state "SET."</p> <p>Weight and Balance</p> <p>Review of all available data revealed that the airplane was within the center of gravity envelope for the flight.</p> <p>Safety Results</p> <p>As a result of the Colgan Air flight 9446 investigation, and the investigation into Air Midwest flight 5481 (DCA03MA022), the Safety Board issued fourteen recommendations to the FAA pertaining to FAR Part 121 air carrier maintenance. One of the recommendations was specific to maintenance procedures for the Beech 1900.</p> <p>During the course of the Colgan Air investigation, Raytheon Aircraft released Temporary Revision 27-9 of the AMM on September 12, 2003, titled "Manual Elevator Trip Operational Check." Raytheon then released Safety Communiqu 234 on September 24, 2003, and Temporary Revision 27-10 on October 22, 2003, which revised AMM 27-30-04 and updated the depiction of the forward trim drum. The FAA issued Airworthiness Directive (AD2003-20-10), which instructed operators to incorporate TR-27-9, and provided a change to the maintenance illustration depicting the forward trim drum.</p> <p>Following the accident, Colgan Air issued an alert to its employees regarding possible trim problems. Colgan Air also expanded the trim check procedure on the First Flight of the Day and the Taxi checklists.</p> <p>Wreckage Release</p> <p>The wreckage was released to a representative of the owner's insurance company on August 31, 2003.</p>		
<p style="text-align: center;">FACTUAL REPORT - AVIATION</p> <p style="text-align: right;">Page 1j</p>		

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National Transportation Safety Board FACTUAL REPORT AVIATION		NTSB ID: NYC03MA183			
		Occurrence Date: 08/26/2003			
		Occurrence Type: Accident			
Landing Facility/Approach Information					
Airport Name Barnstable Municipal Airport	Airport ID: HYA	Airport Elevation 55 Ft. MSL	Runway Used 33	Runway Length 5252	Runway Width 150
Runway Surface Type: Asphalt					
Runway Surface Condition: Dry					
Type Instrument Approach: NONE					
VFR Approach/Landing: None					
Aircraft Information					
Aircraft Manufacturer Beech		Model/Series 1900D		Serial Number UE-40	
Airworthiness Certificate(s): Transport					
Landing Gear Type: Retractable - Tricycle					
Homebuilt Aircraft? No	Number of Seats: 21	Certified Max Gross Wt.	17060 LBS	Number of Engines: 2	
Engine Type: Turbo Prop	Engine Manufacturer: Pratt & Whitney		Model/Series: PT6A-67D	Rated Power: 1214 HP	
- Aircraft Inspection Information					
Type of Last Inspection Continuous Airworthiness	Date of Last Inspection 08/26/2003	Time Since Last Inspection 0 Hours		Airframe Total Time 16503 Hours	
- Emergency Locator Transmitter (ELT) Information					
ELT Installed? Yes	ELT Operated? No		ELT Aided in Locating Accident Site? No		
Owner/Operator Information					
Registered Aircraft Owner Raytheon Aircraft Credit Corporation		Street Address 9709 East Central			
		City Wichita	State KS	Zip Code 67206	
Operator of Aircraft Colgan Air Inc.		Street Address 10677 Aviation Lane			
		City Manassas	State VA	Zip Code 20110	
Operator Does Business As: US Airways Express			Operator Designator Code: NSVA		
- Type of U.S. Certificate(s) Held:					
Air Carrier Operating Certificate(s): Flag Carrier/Domestic					
Operating Certificate:			Operator Certificate:		
Regulation Flight Conducted Under: Part 91: General Aviation					
Type of Flight Operation Conducted: Positioning					
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National Transportation Safety Board FACTUAL REPORT AVIATION		NTSB ID: NYC03MA183																																																																																		
		Occurrence Date: 08/26/2003																																																																																		
		Occurrence Type: Accident																																																																																		
First Pilot Information																																																																																				
Name On File		City On File	State On File	Date of Birth On File	Age 39																																																																															
Sex: M	Seat Occupied: Front	Principal Profession: Civilian Pilot		Certificate Number: On File																																																																																
Certificate(s): Airline Transport; Commercial																																																																																				
Airplane Rating(s): Multi-engine Land; Single-engine Land; Single-engine Sea																																																																																				
Rotorcraft/Glider/LTA: None																																																																																				
Instrument Rating(s): Airplane																																																																																				
Instructor Rating(s): None																																																																																				
Type Rating/Endorsement for Accident/Incident Aircraft? Yes				Current Biennial Flight Review? 06/05/2003																																																																																
Medical Cert.: Class 1		Medical Cert. Status: Valid Medical--w/ waivers/lim.		Date of Last Medical Exam: 03/18/2003																																																																																
<table border="1"> <thead> <tr> <th rowspan="2">- Flight Time Matrix</th> <th rowspan="2">All A/C</th> <th rowspan="2">This Make and Model</th> <th rowspan="2">Airplane Single Engine</th> <th rowspan="2">Airplane Multi-Engine</th> <th rowspan="2">Night</th> <th colspan="2">Instrument</th> <th rowspan="2">Rotorcraft</th> <th rowspan="2">Glider</th> <th rowspan="2">Lighter Than Air</th> </tr> <tr> <th>Actual</th> <th>Simulated</th> </tr> </thead> <tbody> <tr> <td>Total Time</td> <td>2891</td> <td>1364</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Pilot In Command(PIC)</td> <td></td> <td>451</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Instructor</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Last 90 Days</td> <td>211</td> <td>211</td> <td></td> <td>211</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Last 30 Days</td> <td>76</td> <td>76</td> <td></td> <td>76</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Last 24 Hours</td> <td>7</td> <td>7</td> <td></td> <td>7</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>						- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Multi-Engine	Night	Instrument		Rotorcraft	Glider	Lighter Than Air	Actual	Simulated	Total Time	2891	1364									Pilot In Command(PIC)		451									Instructor											Last 90 Days	211	211		211							Last 30 Days	76	76		76							Last 24 Hours	7	7		7						
- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Multi-Engine	Night							Instrument					Rotorcraft	Glider	Lighter Than Air																																																																	
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Seatbelt Used? Yes		Shoulder Harness Used? Yes		Toxicology Performed? Yes		Second Pilot? Yes																																																																														
Flight Plan/Itinerary																																																																																				
Type of Flight Plan Filed: IFR																																																																																				
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Destination		State	Airport Identifier																																																																																	
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Type of Clearance: IFR																																																																																				
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National Transportation Safety Board FACTUAL REPORT AVIATION		NTSB ID: NYC03MA183			
		Occurrence Date: 08/26/2003			
		Occurrence Type: Accident			
Weather Information					
WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
HYA	1556	EDT	55 Ft. MSL	4 NM	180 Deg. Mag.
Sky/Lowest Cloud Condition: Clear				Ft. AGL	Condition of Light: Day
Lowest Ceiling: None			Ft. AGL	Visibility: 10 SM	Altimeter: 29.86 "Hg
Temperature: 23 °C	Dew Point: 20 °C	Wind Direction: Variable		Density Altitude: Ft.	
Wind Speed: 6	Gusts:	Weather Conditions at Accident Site: Visual Conditions			
Visibility (RVR): Ft.	Visibility (RVV) SM	Intensity of Precipitation:			
Restrictions to Visibility: None					
Type of Precipitation: None					
Accident Information					
Aircraft Damage:		Aircraft Fire:		Aircraft Explosion	
Classification:					
- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot	1				1
Second Pilot	1				1
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants					
Other Crew					
Passengers					
- TOTAL ABOARD -	2				2
Other Ground					
- GRAND TOTAL -	2				2
FACTUAL REPORT - AVIATION					

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 National Transportation Safety Board FACTUAL REPORT AVIATION	NTSB ID: NYC03MA183	
	Occurrence Date: 08/26/2003	
	Occurrence Type: Accident	
Administrative Information		
Investigator-In-Charge (IIC) Robert J. Gretz		
Additional Persons Participating in This Accident/Incident Investigation: Floyd A James FAA AAI-100 Washington, DC Robert Ramey Raytheon Aircraft Company Wichita, KS Dave Vance Colgan Air Inc. Manassas, VA Richard Bunker MA Aeronautics Commission Boston, MA Thomas Berthe Pratt & Whitney Canada South Burlington, VT		
FACTUAL REPORT - AVIATION Page 5		

EXHIBIT “2”

John Goglia
73 Auburn Street
Saugus, MA 01906
(781) 233-3675 fax (781) 233-7777
gogliaj@yahoo.com

July 21, 2006,

Mary Schiavo
MOTLEY RICE LLC
28 Bridgeside Blvd.
P.O. Box 1792
Mt. Pleasant, SC 29465

Re: Dean v. Raytheon et al., 05cv10155

REPORT

Dear Ms. Schiavo,

I, John Goglia, I have in excess of 47 years of experience in aviation, including as Member of the Board of the National Safety Transportation Board (NTSB), and mechanic at US Airways. My resume and fee schedule are appended.

This report encompasses observations and opinions related to an aircraft accident occurring on August 26, 2003 involving N240CJ, a Beech (Raytheon) 1900D Airliner operated by Colgan Air, Inc., as flight number 9446.

My opinion and report are based on my reviewing the items in the attached list, an inspection of the wreckage of this aircraft, onsite visits to the maintenance facility at Colgan Air, the inspection of a Beech 1900 at Raytheon Aircraft in Wichita, Kansas, my service as the NTSB Board Member on the scene at the January 2003 crash of a Beech 1900D in Charlotte, North Carolina and my over 47 years of experience.

OBSERVATIONS:

On August 26, 2003, at 1540 eastern daylight time, a Beech 1900D, N240CJ, operated by Colgan Air Inc. as flight 9446 (d.b.a. US Airways Express), was destroyed when it impacted water near Yarmouth, Massachusetts. The certificated airline transport pilot and certificated commercial pilot were fatally injured. Visual meteorological conditions prevailed for the flight that departed Barnstable Municipal Airport (HYA), Hyannis, Massachusetts; destined for Albany International Airport (ALB), Albany, New York. An instrument flight rules flight plan was filed for the repositioning flight conducted under 14 CFR Part 91.

According to data from Federal Aviation Administration (FAA) air traffic control (ATC), the flight departed runway 24 at Hyannis about 1538. Shortly after takeoff, the flightcrew declared an emergency and reported a "runway trim." The airplane flew a left turn and reached an altitude of approximately 1,100 feet. The flightcrew subsequently requested to land on runway 33, and the air traffic control tower (ATCT) controller cleared the flight to land on any runway. No further transmissions were received from the flightcrew. Witnesses observed the airplane in a left turn, with a nose-up attitude. The airplane then pitched nose-down, and impacted the water "nose first."

According to the cockpit voice recorder (CVR), the flightcrew completed the Before Start checklist between 1523 and 1530. At 1523:30, the captain called for the Before Start checklist. At 1523:43, the first officer stated, "preflight's complete. Cockpit scan complete." The captain replied, "complete." At 1523:58, the first officer stated, "maintenance log, release, checked the aircraft." The captain replied, "maintenance and release on aircraft." The captain subsequently identified that the DFDR was inoperative, and confirmed that the minimum equipment list (MEL) was still open.

At 1525:11, the captain began to start the right engine, before being interrupted. Approximately 1 minute later, after a conversation with maintenance personnel over the radio, the captain resumed the starting of the right engine. At 1529:29 the captain began to start the left engine. At 1530:04, the captain called for the After Start checklist. After completing the After Start checklist items, the first officer announced the checklist "complete."

At 1530:50, the flightcrew began a conversation about the flight plan to Albany, NY, taxiing the airplane, and which pilot would fly the airplane. The conversation lasted for about 4 minutes. At 1535:14, during the Taxi checklist, the first officer stated, "...three trims are set." The first officer then called the Taxi checklist "complete." At 1537:00, the airplane was holding short of runway 24. At 1537:17, the captain stated, "all right. Forty six is ready." The flightcrew then began to announce several items, which were identified as being on the Before Takeoff checklist.

At 1538:07, the controller cleared Colgan flight 9446 for takeoff on runway 24. At 1538:08, the flightcrew initiated a takeoff on runway 24. At 1538:40, the first officer stated "V1...rotate."

At 1538:46, the captain stated, "...we got a hot trim..." At that time, according to the digital flight data recorder (DFDR), the elevator trim moved from approximately -1.5 degrees (nose down) to -3 degrees at a speed consistent with the electric trim motor. At 1538:48, the captain stated, "kill the trim kill the trim kill the trim." At 1538:50, the captain stated, "roll back...roll back roll back roll back roll back." According to the DFDR, the elevator trim then moved from approximately -3 degrees to -7 degrees at a speed greater than the capacity of the electric trim motor.

At 1538:56, the captain stated, "roll it back roll my trim..." At 1539:00, the captain stated, "do the electric trim disconnect..." At 1539:04, the captain instructed the first officer to, "go on the controls" with him. At 1539:14, the captain instructed the first officer to retract the flaps. The first officer responded that they were "up."

At 1539:21, the captain declared an emergency regarding a runaway trim and requested to return to the airport. The controller acknowledged the emergency and offered the option of the left or right downwind for runway 24. At 1539:33, the captain instructed the first officer to reduce the engine power. From 1539:49 to 1540:03, the captain instructed the first officer to "pull the breaker."

At 1540:30, the captain requested to land on runway 33. The controller acknowledged the transmission and cleared the flight to land on runway 33.

The recording ended at 1540:47. The accident occurred during the hours of daylight; located approximately 41 degrees, 37 minutes north longitude, and 70 degrees, 15 minutes west latitude.

PERSONNEL INFORMATION

The captain held an airline transport pilot certificate, with a rating for airplane multiengine land, and was type rated in the Beech 1900D. His most recent FAA first class medical certificate was issued on March 18, 2003. The captain was hired by Colgan Air on July 16, 2001, and initially flew as a first officer on the Beech 1900D. He received a Beech 1900D type rating on January 8, 2003. The captain's most recent proficiency check was completed on June 5, 2003. The captain had accumulated a total flight time of 2,891 hours; of which, 451 hours were as pilot in command of a Beech 1900D, and 913 hours were as second in command of a Beech 1900D. In my opinion, his experience behavior and operation of this flight was excellent and met or exceeded the FAA and aviation industry requirements and standards.

The first officer held a commercial pilot certificate with ratings for airplane single engine land, airplane multiengine land, and instrument airplane. His most recent FAA first class medical certificate was issued on August 22, 2003. The first officer was hired by Colgan Air on October 22, 2002, and assigned to the Beech 1900D. His most recent proficiency check was completed on November 3, 2002. The first officer had accumulated a total flight time of 2,489 hours; of which, 689 hours were in a Beech 1900D. In my opinion, his experience behavior and operation of this flight was excellent and met or exceeded the the FAA and aviation industry requirements and standards.

The quality assurance inspector received an airframe and powerplant certificate in 1986. He worked for several companies within the aviation industry and was hired by Colgan Air in June, 2002. He received 40 hours of formal training for the Beech 1900, and on the job (OJT) training as well. His training and experience is typical for the regional industry and this typical industry experience should be known to planned for and adapted to by Raytheon and other industry providers.

The lead maintenance technician that replaced the elevator trim tab cable received his airframe and powerplant certificate in September, 2001. He was hired by Colgan Air on October 2, 2001. He received approximately 94.5 hours of formal training on the Beech 1900, and OJT. The lead maintenance technician had previously replaced a forward elevator trim tab cable on a Beech 1900C with a former employer. His training and experience is typical for the regional industry and this typical industry experience should be known to, planned for and adapted to by Raytheon and other industry providers.

The second lead maintenance technician that assisted in replacing the elevator trim tab cable received his airframe and powerplant certificate in September, 2001. He was hired by Colgan Air on October 2, 2001. He received approximately 72 hours of formal training on the Beech 1900, and on the job training. His training and experience is typical for the regional industry and this typical industry experience should be known to, planned for and adapted to by Raytheon and other industry providers.

AIRCRAFT INFORMATION

The airplane was manufactured in 1993, and equipped with two Pratt & Whitney PT&A engines. The engines are not at issue herein. On January 3, 2003, Colgan Air leased the airplane from Raytheon Aircraft Credit Corporation, and it entered service on January 4, 2003. However the airplane was originally designed as a general aviation aircraft, the Queen Air and the King Air. The manuals and in particular the maintenance manuals were written for general aviation usage. The standards for manuals developed for commercial, scheduled passenger service are far more exacting than manuals for general aviation. In 1997 regional airlines had to meet Part 121 standards, but 1900 manuals were produced under the old less exacting standards. In particular manuals for commercial series should be able to be used by persons with a wide range of skills by mechanics early in their career to those with years of experience. This is especially true with regional aircraft such as the Beech 1900. Mechanics often start their careers on regional aircraft and then progress on to larger planes and engines. A manufacturer must take the skill levels of the workforce into consideration when writing, editing or changing their manuals. Raytheon failed to do so. This failure is further evidenced by the fact that Beech 1900 flight manuals changed and became more extensive over time, but the 1900 maintenance manuals did not. Raytheon did not provide sufficient effort to validate the process contained in manuals to ensure they were adequate to guide individual mechanics through the process.

METEOROLOGICAL INFORMATION

At 1556, the reported weather at Hyannis was: winds variable at 6 knots; visibility 10 miles; sky clear; temperature 78 degrees Fahrenheit; dew point 68 degrees Fahrenheit; altimeter 29.86 inches of mercury. There are no issues relative to the weather nor did the weather contribute to this crash.

FLIGHT RECORDERS

The airplane was equipped with a Fairchild model A-100A Cockpit Voice Recorder (CVR). Transcripts from the NTSB were prepared. Plaintiff's experts also prepared a more complete transcript and provided to me. I have had access to the actual recording. The audio information is poor to good.

The recording of the pilots' communication reveals professional communications, good work skills and excellent crew resource management. There is very, very little extraneous communications. I have worked on many crashes over my long career and these communications were among the "cleanest" meaning containing among the least extraneous discussions of any I have heard or read. The pilots in my opinion complied with cockpit communication rules.

The airplane was equipped with a L#COM (Fairchild) Model F1000 (S/N 00505) Digital flight Data Recorder (DFDR). A DFDR readout was taken from the recorder. The DFDR recorded data is in a digital format. Although the recorder was damaged by impact forces, documents state the memory module was not damaged. The timing of the DFDR data was correlated to air traffic control and CVR timing and this information was provided to me.

AIRCRAFT PERFORMANCE

Available information indicates the elevator pitch trim was shifted 2.07 degrees nose-up based on a maximum nose down value.

Performance studies provided to me reveal that during the takeoff roll, the elevator did not leave the trailing edge down stop as soon, and did not move in the trailing edge up direction as rapidly, as during previous takeoffs. The data indicates a kinematics extraction revealed that approximately 60 pounds of control column pull force was required immediately after rotation, which was greater than previous flights.

The data indicates that once airborne, the airplane performance was consistent with the elevator pitch trim moving to the full nose down position. The airplane climbed to approximately 1,100 feet above sea level, before descending into the water. As the airspeed exceeded 200 knots during the flight, and approached 250 knots during the descent, the control column forces increased to approximately 250 pounds which is impossible for the pilots to counteract and sustain with human force.

MAINTENANCE

Colgan Air employed its own maintenance technicians that performed all of the necessary scheduled and phase maintenance on its fleet. From my own experience I am familiar with Colgan's maintenance and operations. The FAA inspected and approved Colgan's maintenance facilities and procedures. Raytheon also inspected, audited and reviewed Colgan's maintenance of Raytheon's aircraft. Furthermore, U.S. Air audited and

approved Colgan's operations. The fleet was maintained under a continuous airworthiness maintenance program (CAMP), which was developed by Colgan Air and approved by the FAA. The CAMP was a series of checks and inspections, which incorporated guidance from the Beech 1900D airliner maintenance manual (AMM). The various inspections included in the CAMP were: Preflight Inspections, Routine Inspections, Detail Inspections and Structural Inspections. The Preflight Inspections were due every 4 flight-days and the Routine Inspections were due every 8 flight-days.

The documents herein indicate the Detail Inspections were divided into six phases, and each phase was performed every 220 flight-hours, which resulted in a completed Detail Inspection after every 1,320 flight hours. The Structural Inspections were set forth by the manufacturer. Each Detail Inspection focused specifically on a certain part of the airplane. They were: Wings, Powerplant and Nacelles, Flight Compartment/Cabin, Environmental Systems, Landing Gear, and Aft Fuselage/Empennage.

Records indicate On August 23, 2003, the accident airplane underwent a Detail Six phase check (Aft Fuselage/Empennage). The remaining work was deferred on the morning of August 24, per the general maintenance manual (GMM). Ten revenue flight legs were completed on that day. The Detail Six phase check resumed on the evening of August 24, and concluded on August 26.

A maintenance technician conducted a free play check of the left and right elevator trim actuators as part of the Detail Six phase check. Both the actuators failed the check, and the failure required replacement of the actuators. During the replacement of the actuators, the cable unwound off the forward drum. On August 25, during the operational check of the system, the forward elevator trim tab cable "fell off" the forward drum, seized and kinked. There is some discussion about why this occurred and this is further indication that the manual is deficient and fails to provide adequate guidance to line mechanics, but, it is irrelevant to the cause of the crash, because once the cable came off and the kinking occurred, the cable had to be replaced.

A new forward elevator trim tab cable was ordered. Due to an incorrect right elevator trim actuator part number, a new right elevator trim actuator was also ordered. There was difficulty obtaining the proper parts because they were not available. Two lead maintenance technicians replaced the forward elevator trim tab cable and two other maintenance technicians replaced the right elevator trim actuator. The forward elevator trim tab cable drum had already been removed by personnel on the dayshift. No turnover notes were forwarded because. Neither the Raytheon/Beech AMM nor Colgan Air policies required turnover notes from one shift to another.

The two lead maintenance technicians that replaced the forward elevator trim tab cable did not use a lead wire but instead, they marked the topmost cable pulleys with a "T". Industry standards and practice expect the mechanics will develop practical procedures and practice; in their work. This is an accepted industry practice of which the FAA is aware and allows. A lead maintenance technician and the quality assurance inspector stated that following the maintenance a successful operational check of the system was

completed. They added that the operation check included running the manual and electric elevator trim several times, with the quality assurance inspector at the cockpit and tailbone during different phases of the operations check.

It is my opinion that it is indeed possible for the mechanic to have checked the system several times with personnel in the cockpit and at the tail, yet still have misrigged the system because of defective and deficient design of the aircraft. The trim wheel system has contradictory wording on the wheel and the pedestal. The wheel says [aft] and the pedestal says [forward]. Depending on which you are looking at, you get opposing results. This conflicting and confusing marking is defective and does not meet industry standards. I know of no other series of other planes marked in this confusing manner.

Review of the Beech AMM Chapter 27-30-04, "Elevator Trim Tab Cables – Maintenance Practices," revealed that the trim drum was depicted backwards. Although the drum could not be installed backwards, the backwards depiction caused the mechanics to misroute the cable around the drum, and reverse the trim system. The depiction in the maintenance manual showed the nose-up trim tab cable coming from the aft end of the drum, rather than the forward end. It also showed the nose-down cable coming from the forward end of the drum, rather than the aft. These errors were the cause of this crash. Maintenance personnel are visual and the backward depiction was a trap. The erroneous drawing could and did cause the mechanic to misroute the cable around the drum. By relying on the erroneous drawings, the trim system could easily be reversed, and it was.

Diagrams are included in airliner maintenance manuals when the procedures are confusing, difficult and not adequately explainable by words alone. Diagrams, when included, are almost always looked at and relied upon by mechanics, just as the old saying goes, "A picture is worth a thousand words." This is especially true in aviation. Raytheon/Beech were responsible not only to make sure the diagram was correct in the first place, but they should have had a process in place to continuously review the manuals, for errors and not wait on operators to discover problems for Raytheon or to find and correct errors plane crash by plane crash. Finding their mistakes only after fatal crashes is clearly contrary to Raytheon's airworthiness requirement. They were obligated to review the manual and validate the procedures for critical flight systems before providing those instructions to the operators.

After the fatal crash of a Beech 1900D in January 2003, a Raytheon representative told me he was shocked to find out that Raytheon/Beech did not validate their procedures. The fact that once they discovered this deficiency they did not fully review and correct the AMM after the fatal January 2003 accident is further indication of the deficiency of their manuals and the deficiency and disarray of their system to correct and identify and find these errors. Raytheon was at meetings or concerning meetings of the January 2003 crash in January 2003 when we identified a critical flight system with erroneous maintenance instructions and the fact that they did not shows that they did not comply with their obligations of continuing airworthiness. The Raytheon/Beech 1900D is among the weakest AMM's for continued airworthiness I have ever seen in my 47 years of experience. Scheduled airlines (those operating under part 121) are required to operate at

the highest levels of safety. The deficient instructions in this manual made it much, much more difficult to operate safely.

The Beech AMM was also fatally flawed because there was no procedure for an operational check contained in Chapter 27-30-04. Another fatal flaw is the fact that there was no referral to Chapter 27-30-09, "Elevator Trim – Maintenance Practices...Elevator Trim Operational Check," which did contain a procedure for an operational check of the elevator trim system. However, airliner maintenance manuals are thousands of pages, if using the paper version, or billions of data bytes if using the electronic version. You cannot scan or "flip the pages" in an electronic version unless you know the specific reference. Electronic items can be difficult or impossible to find.

The failure to include the operational check with the maintenance procedures, or to include a reference or referral to the operational check, is also an unacceptable defect in the manual which can and did cause this accident. The mechanics were left to improvise and cannot be faulted for doing so. More shocking than these defects is that Raytheon never completed a validation procedure on their manual to discover just such defects and errors. After a fatal crash in Charlotte, NC, in January 2003 of this same type of plane, just seven months before this fatal crash, Raytheon officials stated to me they realized their maintenance manuals had problems, and represented that they were starting a validation procedure on the manual. However, at the time of this crash, they had not finished it. At no time did they warn Colgan, or its mechanics or its pilots of the problems with its manuals, despite knowing of Colgan's and others' reliance on the maintenance manuals and procedures. Most tragic is the fact that Raytheon discovered, after the Charlotte crash and before the Hyannis crash that they neglected or failed to include the operational check procedure in Chapter 27-30-04, "Elevator Trim Tab Cables." However, despite the fact that Raytheon had many, many calls with Colgan mechanics to guide, direct and assist Colgan over the three days Colgan mechanics worked on the trim tab cables, they did not inform the Colgan mechanics of the missing check procedures or reference to the operational check procedures. Instead, according to the sworn deposition of a Raytheon employee, they mailed to Colgan, the day of this crash, via surface U.S. "snail mail," the amended manual pages including a reference to the check procedures. Raytheon's failure to inform the mechanics of these errors, though they had discovered them, and then putting the corrections in the mail the day of the crash, is unacceptable and with the backwards drawings and other manual defects, caused this crash and the deaths of these two pilots. Flawed, erroneous or incorrect maintenance manuals and instructions can, and did, render unworthy the Beech 1900D.

MEDICAL AND PATHOLOGICAL INFORMATION

I reviewed the autopsy performed on the pilots by The Commonwealth of Massachusetts, Department of Health, Office of the Chief Medical Examiner, Boston, Massachusetts, and the toxicological testing conducted on the pilots at the FAA Toxicology Accident Research Laboratory, Oklahoma City, Oklahoma. I find absolutely no indication of any physical impairment of the pilots. There were no substances in their systems.

TESTS AND RESEARCH

Quoting from information provided in this case, the cockpit controls consisted of a manual trim wheel; and two switches on each yoke, which activated an electric elevator trim motor. When moved in the nose up direction, and using "0" as a point of origin, the manual wheel was indexed at "0, AFT, 3, FWD, 6, -, UP, -, -, 10, -, UP," and terminated at a white box. When moved in the nose down direction, using "0" as a point of origin, the manual wheel was indexed at "0, -, DN, -, 3," and terminated at a white box. The trim wheel connected to a sprocket, driving a chain to a second sprocket, connected to the elevator trim cable drum. The sprockets, chain and trim drum were located inside the cockpit pedestal. One side of the drum had a slotted side or key way, which connected to the sprocket, and prevented the drum from being installed backwards. The approximate 55-foot long forward elevator trim cable was wrapped around the drum and secured with a cable lock pin.

Raytheon Aircraft documents in the case indicate the electric trim system could be disconnected in any of four ways but that the electric trim would be overridden by manually rolling the trim wheel. I reviewed mis-rigging demonstration information from demonstrations conducted at Raytheon Aircraft, Wichita, Kansas, on October 14 and 15, 2003. When the cockpit trim wheel was positioned nose down, the elevator trim tabs moved in a nose-up direction. When the cockpit trim wheel was positioned nose-up, the elevator trim tabs moved in a nose-down direction. But, when the electric trim motor was activated in one direction, the elevator tabs moved in the corresponding correct direction, but the trim wheel moved opposite of the commanded electric trim direction. Therefore, the electric trim still worked and the electric trim indicators would have appeared normal to the pilots.

The mis-rigging demonstration established that when the manual trim wheel was in the nose-down direction, the trim indicator in the cockpit showed nose down, but the trim tabs at the back of the plane were in the full nose up position. When the manual trim wheel was moved in the nose-up direction, the trim indicator moved in the nose-up direction, but the trim tabs on the back of the plane were in the full nose down position.

Flight Simulator

I reviewed the simulator recreations of the flight convened at Flight Safety International, Flushing, New York, on November 25, 2003. Using an FAA certified Level "D" Beech 1900 full motion simulator, the group attempted six simulations of the accident flight. The chief pilot of Colgan Air and an FAA inspector manipulated the controls during the flight simulations. Raytheon was also present.

During all simulations, the elevator trim was positioned full nose-down shortly after takeoff. The simulator pilot attempted to maintain aircraft control using different power settings to obtain different airspeeds. Five of the six simulations resulted in an uncontrolled descent into terrain.

On the sixth test, the simulator pilot was able to partially maintain control of the airplane by gradually reducing engine power and maintaining an airspeed of approximately 170 knots. However, he had to return to the airport area at 170 knots, and touchdown at 180 knots. The airplane did not land on a runway, and subsequently impacted terrain.

ADDITIONAL INFORMATION

Aircraft Maintenance and Flight Log

I reviewed information concerning the FOPP which detailed the captain's responsibilities for determining the airworthiness of the airplane. It stated:

"Review/Verify the Aircraft Maintenance & Flight Log back to the latest valid Airworthiness Release and ensure that all discrepancies between that Airworthiness Release and the current log page are corrected or properly deferred. If the Captain determines that the aircraft status is other than listed on the release, the Captain will inform System Control and correct the inconsistency."

Review of the Aircraft Maintenance and Flight Log form for the accident flight revealed a discrepancy, which stated, "Flt. Data Recorder needs downloading due to mx. Replacement of Elevator trim tab cable (Fwd. Most)." The discrepancy was signed by a maintenance technician. The discrepancy was released and signed by the same maintenance technician, in accordance with an approved minimum equipment list, and supporting control number.

It is my opinion that the Captain met his responsibilities and reviewed the log because he specifically mentioned the open Minimum Equipment List item (MEL) which is the reason they were moving the plane to Albany for further maintenance on the open MEL list. Such flights are common in the industry and the MEL items are completed and signed off on after the repositioning flight with no impact on or without affecting the airworthiness of the aircraft.

CORPORATE STRUCTURE AND SUPPORT OF THIS AIRCRAFT

The provision of this aircraft to Colgan, as well as to other aircraft operators, is not limited to the aircraft only – not just the wings, engines, fuselage, landing gear, seats, instruments etc. When a manufacturer designs and produces an aircraft for sale or lease, particularly for scheduling passenger service (Part 121 operations), the design and production of an aircraft includes, as part of the plane, the maintenance manuals and maintenance support and advice.

In my opinion, not only were the maintenance manuals defective, in that they contained hundreds of errors, including the fatal errors that caused this crash, but they were defective because Raytheon/Beech failed to complete a validation and verification procedure on their manuals. In layman's terms that means Raytheon never themselves

tested the maintenance manuals to see if mechanics of the skills and training in the industry could perform the repair and maintenance procedures as described in the manuals. Instead, Raytheon relied upon operators, meaning airlines, to find and report mistakes in Raytheon's manuals.

In the real world of flight operations that means Raytheon in some cases did not find the mistakes in the manuals until people died. Raytheon, as amply demonstrated by its responsibility under continuous airworthiness management under requirements, must provide instruction to operators to maintain the plane, review its procedures and find and correct its own errors. That is an obligation and a responsibility a manufacturer cannot shirk or seek to push off on operators. The maintenance manual is part and parcel of the plane. This manual was clearly defective, Raytheon before this crash knew the manual had problems. Raytheon has started, but had not yet finished, finding and correcting errors in the manuals and maintenance instructions. Even when it knew of errors in the manual pertaining to the repair on which Raytheon representatives were advising Colgan during August 24 – 26, 2003, it failed to warn or even advise Colgan mechanics of the problems in the manual, or even extend proper advice and assistance. Raytheon instead mailed a correction on the morning of the crash. It is not reasonable to expect Colgan maintenance and Colgan pilots to discover mistakes made by Raytheon, when Raytheon, while supposedly assisting the mechanics through the procedures, failed to detect and correct Raytheon's mistakes.

The corporate structuring, or rather frequent restructuring, and the rapid turnover of Raytheon management also contributed to cause this crash. The frequent changing of senior management is a negative event, and prevented necessary monitoring and repair of the problems and deficiencies. There was no continuity of process to improve instructions to operators.

An internal Raytheon memo among the material produced in this case summarized the plight of Colgan in relying on Raytheon for support. Colgan was "jumping through hoops." Raytheon failed to provide the proper management and support of the 1900D, and this lack of corporate responsibility directly caused or contributed to this fatal crash.

I reserve the right to correct or edit this report or opinion as new information and reports become available and I anticipate responding to other experts' opinions when they are provided.

Respectfully submitted,


John Goglia

Materials Reviewed**Depositions from Colgan v Raytheon:**

Colgan Employees	Raytheon Employees
<ul style="list-style-type: none"> ▪ Barrett, John ▪ Barth, Patti ▪ Battaglia, Dominick ▪ Desmond, James ▪ Gonzales, Kevin ▪ Kinan, Daniel Robert ▪ Ratliff, Larry ▪ Rodriguez, Miguel ▪ Sarluca, Perry ▪ Servis, Scott ▪ Vallejo, Thomas Jeffery ▪ Vance, David 	<ul style="list-style-type: none"> ▪ Crowe, Willard Vol. 1 & 2 ▪ Ernzen, Kimberly ▪ Green, Tim ▪ Jaeger, Ronald ▪ Jolicoeur, Mike ▪ McCarthy, Matthew ▪ Peay, Tom ▪ Pedroja, Robert ▪ Ramey, Robert Vol. 1 & 2 ▪ Rosenberg, David ▪ Scheidt, Michael
Colgan Experts	Raytheon Experts
<ul style="list-style-type: none"> ▪ Irvin, James ▪ Leonelli, Fred ▪ Michaels, Paris 	<ul style="list-style-type: none"> ▪ Law, Dwight ▪ Nelson, Richard

Depositions from Dean v. Raytheon:

1. Havnen, Donovan
2. Root, Monty
3. Crowe, Willard – Vol. 1 & 2
4. Peay, Tom
5. Scheidt, Michael

Documents

- National Transportation Safety Board (NTSB) Factual Report for N240CJ Incident
- Mr. Don Havnen, VP of Operation Raytheon Aviation Services, letter dated 9/29/2003
- FAA Airworthiness Directive 2003-20-10
- NTSB Safety Recommendation for N233YV incident at Charlotte-Douglas International Airport
- Raytheon Aircraft Safety Communiqué No. 234 dated September 2003
- David L. Kohlman of Engineering Systems Inc., report on testing of Beech 1900D
- Raytheon Aircraft Mandatory Service Bulletin 27-3032 issued July 2003
- Yarmouth Police Department, Lieutenant Raul J. Rooney witness report
- Patrick M. Armstrong witness report
- Richard Bunker statement regarding fuel truck inspection
- Bryan Moore witness statement
- Tim Bischoff telephone interview
- Jim Kittredge telephone interview
- FAA Final Forensic Toxicology Fatal Accident Report
- NTSB Colgan Air Flight 9446 Airplane Performance Study
- NTSB Flight Data Recorder (FDR) Study
- NTSB Group Chairman's Factual Report of Investigation, Cockpit Voice Recorder (CVR).
- NTSB Aircraft Maintenance and Records Group Factual Report
- Raytheon Aircraft Company (RAC) letter by Robert Ramey (Ramey), dated May 6, 2004

- Colgan Air Party of Submission of Colgan Air to the NTSB
- RAC letter by Ramey, dated 8.12.04
- Colgan Air Beech 1900 Checklist
- Chronology of contact between Colgan Air and RAC during period August 23-26, 2003
- RAC (Ramey) letter dated 10.07.03, 10.27.03, 11.04.03, 11.06.03, 11.14.03, 11.20.03, 12.01.03, 12.22.03, FAA Compliance Review by Riddle 01.09.04, FAA letter re: Aileron and Rudder Trim System Controls (Riddle) 1.13.04, RAC (Ramey) letter dated 01.14.04, 01.23.04, 04.05.04, 04.21.04, 04.22.04, 05.04.04, 05.11.04, 05.21.04, 05.27.04, 06.02.04, 09.22.04
- Raytheon Aircraft Beech 1900D Airline Maintenance Manual (AMM) – Elevator Trim-Maintenance Practices, Elevator Trim Operational check 27-30-09.
- RAC Temporary Revision No. 27-9, dated 9.12.03
- RAC Temporary Revision No. 27-10, dated 10.22.03
- RAC Temporary Revision No. 27-12, dated 12.18.03
- Raytheon Aircraft Beech 1900D Airliner Maintenance Manual (AMM) – Elevator Control Rigging – Maintenance Practices – 27-30-02
- RAC Beech 1900D AMM – Elevator Trim Tab Cables – Maintenance Practices, Forward, Aft, Vertical & Horizontal – Elevator Trim Tab Cable Removal & Installation – 27-30-04
- RAC Beech 1900D AMM – Elevator Trim Tab Control Rigging – Maintenance Practices, Elevator Trim Tab Rigging – 27-30-05
- RAC Beech 1900D AMM – Elevator Tab Actuators – Maintenance Practices – 27-30-02
- RAC Beech 1900D AMM – Elevator Trim Tab Indicator – Maintenance Practices – 27-30-08
- RAC Beech 1900D AMM – Elevator Trim – Maintenance Practices – 27-30-09
- RAC Beech 1900D AMM – Sixth 200-Hour Interval Detailed Inspection – 5-20-07
- RAC Publication To Be Changed, No. 2003Pcr08-05
- RAC Publication To Be Changed, No. 2003Pcr09-01.
- FAA Field Notes for the Elevator Trim System Evaluation
- NTSB Airworthiness Group Chairman's Field Notes, dated 09.05.03
- NTSB Airworthiness Group Chairman's Field Notes, dated 10.22.03
- NTSB Airworthiness Group Chairman's Factual Report of Investigation, dated 04.12.04
- Raytheon Electronic Publication System (REPS) 27-30-01-201, Revision 9, dated May 2003
- REPS 27-30-04-2001, Revision 21, dated May 2005
- Transcript of Dominick Battaglia, dated August 27, 2003.
- Transcript of Dan Kinan interview, dated 8.27.03
- Transcript of Jeff Vallejo interview, dated 8.27.03
- Videotape and still photos of a 1900D trim system
- Report of Colgan Expert, James Irvin
- Report of Colgan Expert, Paris Michaels
- Report of Colgan Expert, Frederick Leonelli
- Report of Raytheon Expert, Dwight Law
- Report of Raytheon Expert, Richard Nelson
- Table of Contents (TOC) for the NTSB Docket on this accident
- 2003 CFR Title 14 Part 21 – Certification Procedures for Products & Parts
- 2003 CFR Title 14 Part 23 – Airworthiness Standards: Normal, Utility, Acrobatic, and Commuter Category Airplanes
- 2003 CFR Title 14 Part 39 – Airworthiness Directives
- 2003 CFR Title 14 Part 43 – Maintenance, Preventative Maintenance, Rebuilding, and Alteration
- 2003 CFR Title 14 Part 65 – Certification: Airmen Other than Flight Crewmembers
- 2003 CFR Title 14 Part 91 – General Operating and Flight Rules
- 2003 CFR Title 14 Part 121 – Operating Requirements: Domestic, Flag, & Supplemental Operations
- NTSB Docket Contents

EXHIBIT “3”

602005-48

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Exhibits 1-11

UNITED STATES DISTRICT COURT
DISTRICT OF MASSACHUSETTS

----- CONSOLIDATED UNDER

YISEL DEAN, et al.

CASE NO. 05-10155 PBS

Plaintiffs

v.

CA No. 05 CV 10155 PBS

RAYTHEON COMPANY, a Delaware
corporation, et al.

Defendants

LISA A. WEILER, et al.

Plaintiff

v.

CA No. 05 CV 1034 PBS

RAYTHEON COMPANY, a Delaware
corporation, et al.

Defendants

DEPOSITION of JOHN J. GOGLIA

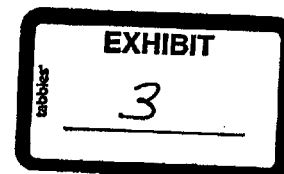
Monday, September 18, 2006 - 9:20 a.m.

Dwyer & Collora, LLP

600 Atlantic Avenue

Boston, Massachusetts

Reporter: Jill K. Ruggieri, RMR/CRR



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1 A I had interest in all of them, but I really
2 had interest in the visuals, because it's
3 such a powerful way to deliver a message, in
4 its infancy, at NTSB in its infancy, so any
5 work they do, it's curiosity more than
6 anything else.

7 Q Okay.

8 And were you one of the people that
9 was promoting the use of visuals at the
10 NTSB?

11 A I don't know that anybody really promoted
12 them, the lab, they were going that way
13 anyway. If someone asked me if I thought it
14 was a good idea, I would have said yes, but
15 I don't know that I was ever asked.

16 Q While you were with the NTSB, there were
17 five members of the NTSB?

18 A Well, it would vary, you know, when. There
19 is a five-member board. Sometimes the
20 numbers diminish because people leave.

21 Q You were one, at least one?

22 A I was one of the five.

23 Q And while you were there, was your level or
24 your responsibilities to the NTSB focussed

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in any particular way?

2 A We all have areas of interest.

3 Q That's what I'm getting at.

4 A Yes, my area is naturally, coming out of the
5 maintenance community, maintenance was very
6 high on my list. Birds around the airport,
7 wildlife around the airport was a great
8 interest of mine.

9 Firefighting, which those two kind of
10 flow together, airport rescue and
11 firefighting.

12 Q So if there were an issue of maintenance in
13 an accident or an issue of wildlife, bird
14 strike or firefighting, you would naturally
15 be involved in that investigation?

16 A No, not in -- you need to define the word
17 "involved."

18 Let me help you, maybe. The staff
19 are the experts.

20 Q Right.

21 A So the board members, you would make -- ask
22 them questions, ask them what's the status,
23 you know, in general, what's going on, but
24 you would not be participating in any

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1 meaningful way within the investigation, so
2 you would sort of be an interested observer.

3 Q Overseeing?

4 A Too strong a word, I think, at least the way
5 I would think overseeing.

6 Q Okay.

7 I premarked what is referred to as
8 Goglia 2.

9 A Mm-hmm.

10 Q Is that a copy of your resume?

11 A It certainly looks like it.

12 Q Is it complete and accurate as of today?

13 A Actually, I think there's more to be added
14 to this, but -- can you give me a minute to
15 look at it?

16 Q Please.

17 (Witness read document.)

18 A Mm-hmm, yes, I think -- there need to be
19 some additions, but, yes.

20 Q Could you give us the additions?

21 A Well, for example, I just finished a roughly
22 three-month piece of employment with a
23 company called CJ Services as their vice
24 president, 135 schedule, 135 operator, as

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1 their vice president of safety while they
2 found a replacement. That's one jumps right
3 out.

4 Q So you worked there for three months?

5 A Mm-hmm.

6 Q That's a yes?

7 A Yes, I'm sorry.

8 I don't like this one, but the
9 professional awards is left off many, many,
10 many of them.

11 Q Well, the professional awards, in what area
12 did you receive those awards?

13 A Oh, I've been recognized across -- the
14 Society of Automotive Engineers, SAE, has
15 given me a number of awards for management,
16 for all the work that I did trying to raise
17 the bar and connect engineering and
18 maintenance together.

19 Q Were these awards while you were a member of
20 the NTSB?

21 A Yes. They may have been something that fell
22 off the bottom in '04, but basically yes.

23 Q For what period of time were you a member of
24 the NTSB?

5 (Pages 14 to 17)

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1 A From 1995 to 2004.
 2 Q Did you resign in 2004?
 3 A My term was up. The board members
 4 receive --
 5 Q And you were not reappointed?
 6 MR. BUNIS: Wait for a question.
 7 Q Go ahead. What were you going to say?
 8 A The board members are nominated by the
 9 President for five-year terms and you're
 10 confirmed by the Senate, and so I received
 11 two nominations to the board.
 12 Q So in 2004, did you then go to work for CJ
 13 Services?
 14 A No, CJ Services was just recently.
 15 Q Okay.
 16 A When I left the NTSB, I was recruited by
 17 St. Louis University to come be a professor.
 18 I really didn't want to give them full time,
 19 so we negotiated a less-than-full-time
 20 agreement so that I was free to do other
 21 things.
 22 And at that point, sometime in that
 23 couple, three-month time frame after I left
 24 the board, I ended up working for, loose

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1 term -- becoming involved with JDA Aviation
 2 Technology Solutions in Washington, DC, to
 3 do some consulting.
 4 Q So three months after you left the NTSB, you
 5 were doing consulting with JDA Aviation
 6 Technology?
 7 A Yes.
 8 Q What does JDA stand for?
 9 A That's Joe Del Balzo Associates. Joe Del
 10 Balzo is a former FAA administrator, ten
 11 years ago.
 12 And I also might add that they call
 13 me the vice president of government affairs
 14 for the Professional Aviation Maintenance
 15 Association. It's a \$1 a year position,
 16 just to -- which I'm still waiting to get my
 17 first dollar.
 18 Q Okay.
 19 A Funny how that works.
 20 Q When did you go to work at St. Louis
 21 University?
 22 A That was pretty quick after I left the
 23 board.
 24 Q How long did you work there?

Page 20

1 A I'm still employed there.
 2 Q Okay.
 3 And you're a professor?
 4 A I'm a professor.
 5 Q What do you teach?
 6 A Right now, I teach the NTSB stuff, policy,
 7 procedures, how it works. Essentially
 8 guest-lecturing in other people's classes.
 9 My role there was to build the Center
 10 for Integrated Emergency Response, the
 11 management thereof, and trying to tie
 12 together the good processes that we use in
 13 airports in the event of emergencies with
 14 the communities.
 15 Most large airports are very good at
 16 what the fire department calls mutual aid,
 17 but they cross that mutual aid over areas
 18 that aren't very good at mutual aid, if you
 19 will, the principals, like the police, like
 20 emergency responders.
 21 Sometimes the -- and the politics
 22 there of -- you know, it gets very
 23 geographical, people get territorial.
 24 So after 9/11 it really needs to be

Page 21

1 much more integrated, so that's the goal,
 2 especially when you move to smaller
 3 communities, away from metropolitan areas
 4 like we have here, those processes are not
 5 bad. Move out to western Massachusetts, for
 6 example, and it gets to be difficult for
 7 them to respond to big events.
 8 So we've been trying to focus on
 9 taking the lessons learned and best
 10 practices from the bigger communities and
 11 figure out ways to integrate them into the
 12 smaller communities.
 13 Q As an example, would that be a problem that
 14 New York had on 9/11 when the police
 15 commissioner realized that he didn't have an
 16 air force but he was being attacked from the
 17 air and who did he call?
 18 Is that --
 19 A Similar, yes, yes.
 20 Q Yes.
 21 A Actually, it comes all the way back to TWA
 22 800 and before, you know?
 23 TWA 800 was way out on the end of
 24 Long Island. These little communities have

6 (Pages 18 to 21)

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<p style="text-align: right;">Page 74</p> <p>1 A Mm-hmm.</p> <p>2 Q You stand by that statement?</p> <p>3 A Mm-hmm.</p> <p>4 But now --</p> <p>5 Q That's a yes.</p> <p>6 A Yes.</p> <p>7 But now I'm no longer there to look</p> <p>8 at those, so --</p> <p>9 Q Right.</p> <p>10 The Charlotte accident involving the</p> <p>11 Beech 1900 was January of 2003; is that</p> <p>12 correct?</p> <p>13 A That's correct.</p> <p>14 Q You were with the NTSB at the time; is that</p> <p>15 right?</p> <p>16 A That's correct.</p> <p>17 Q What was your role or responsibility in the</p> <p>18 Charlotte accident?</p> <p>19 A I was the board member on scene, as it's</p> <p>20 called, so I am the official spokesman for</p> <p>21 the board. That means for the five board</p> <p>22 members.</p> <p>23 Q Is there always one member of the NTSB that</p> <p>24 is designated to be the NTSB member on</p>	<p style="text-align: right;">Page 76</p> <p>1 A To keep the family members briefed, make</p> <p>2 sure that there was no obstacles in the way</p> <p>3 of the IIC and the team.</p> <p>4 Q IIC?</p> <p>5 A Investigator in charge. You know, that</p> <p>6 could mean political obstacles, you know, if</p> <p>7 they need to expend resources and maybe they</p> <p>8 can't reach the chairman and through their</p> <p>9 own chain, they don't talk to the chairman</p> <p>10 directly.</p> <p>11 So the board member can bring to bear</p> <p>12 other resources or influences to help make</p> <p>13 the job go the way it should go.</p> <p>14 Q Okay.</p> <p>15 Did you actually go down to the</p> <p>16 accident scene?</p> <p>17 A Oh, yes.</p> <p>18 Q More than once?</p> <p>19 A No, just once to the scene. I was there for</p> <p>20 I think three days. You know, multiple</p> <p>21 days.</p> <p>22 Q Did you meet with or communicate with</p> <p>23 anybody from Raytheon?</p> <p>24 A I don't believe so.</p>
<p style="text-align: right;">Page 75</p> <p>1 scene?</p> <p>2 A There is always just one. They don't go to</p> <p>3 every accident.</p> <p>4 Q No, I understand.</p> <p>5 A But, yes, there's always one.</p> <p>6 Q So you were designated for Charlotte?</p> <p>7 A Yes.</p> <p>8 Q What about the Hyannis accident?</p> <p>9 A No, I wasn't. I believe that was member --</p> <p>10 actually, I don't think we had anybody in</p> <p>11 Hyannis.</p> <p>12 Q They didn't designate anyone?</p> <p>13 A No.</p> <p>14 Q Why would that be?</p> <p>15 A Ferry flight, no passengers, just a crew.</p> <p>16 Could be one reason. I'm not sure that I</p> <p>17 know.</p> <p>18 Q Okay.</p> <p>19 The Charlotte accident in January of</p> <p>20 2003, again, you were designated as the</p> <p>21 official member of the NTSB on scene, so you</p> <p>22 would be the spokesman, among other things?</p> <p>23 A Correct.</p> <p>24 Q What else was your responsibility?</p>	<p style="text-align: right;">Page 77</p> <p>1 What time frame are we talking about?</p> <p>2 Q At the time you went to the scene.</p> <p>3 A At the scene? I don't believe so.</p> <p>4 Q Okay.</p> <p>5 Was anybody from Raytheon at the</p> <p>6 scene?</p> <p>7 A I'm sure -- there's always the investigators</p> <p>8 from the manufacturer, yes, and I'm sure</p> <p>9 that we have to go back up with that</p> <p>10 communication statement. I read that to be</p> <p>11 that I talked directly to somebody from</p> <p>12 Raytheon.</p> <p>13 Q Right.</p> <p>14 A And that was -- that's a no, that I know of.</p> <p>15 Q All right.</p> <p>16 A But in the room full of investigators that</p> <p>17 we have, I'm sure there was at least one or</p> <p>18 maybe more Raytheon representatives from the</p> <p>19 accident investigation area, and I may have</p> <p>20 actually even said something to them, but</p> <p>21 not knowing that they were from Raytheon.</p> <p>22 Q Okay.</p> <p>23 The investigation focused on what</p> <p>24 part of the airplane?</p>

20 (Pages 74 to 77)

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- 1 A Ultimately?
- 2 Q Yes.
- 3 A We went to the tail, because the airplane
- 4 was having control problems. The flight
- 5 data recorder, while we were still on scene,
- 6 gave us some valuable information that led
- 7 us back there.
- 8 Q Okay.
- 9 A So while all the other things continued to
- 10 be done, a special focus will start zeroing
- 11 in on that area.
- 12 Q And eventually, the probable cause of the
- 13 accident was determined by the NTSB?
- 14 A Yes, yes.
- 15 Q What was the probable cause?
- 16 A Oh, it was misrigging the airplane, as a
- 17 broad statement. I don't remember verbatim
- 18 what it said.
- 19 Q Do you know what portion of the tail was
- 20 misrigged?
- 21 A It was an elevator.
- 22 Q Not elevator trim?
- 23 A Well, it could have been the trim. I don't
- 24 remember.

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- Q You don't remember?
- 2 A (Witness shakes head.)
- 3 Q And in connection with your investigation in
- 4 this case, did you ever go back and look at
- 5 the Charlotte accident?
- 6 A No. Other than what my memory provided.
- 7 Q Well, this case involves elevator trim?
- 8 A Mm-hmm.
- 9 Q Which is certainly different rigging from
- 10 elevator trim, right?
- 11 MR. BUNIS: Objection. I think you
- 12 may have misspoken.
- 13 A Yes, you said the same thing twice.
- 14 MR. BUNIS: I think you said this
- 15 case involves elevator trim which is
- 16 certainly different from elevator trim.
- 17 MR. KNIGHT: Oh, did I say that?
- 18 Well, let me correct it.
- 19 Q The case involving Hyannis involves elevator
- 20 trim, right?
- 21 A Yes.
- 22 Q The case involving Charlotte, do you know
- 23 whether or not that involved elevator
- 24 rigging as opposed to trim?

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- 1 A I believe it was elevator rigging.
- 2 Q So that's a different set of system?
- 3 A Different cables. Related but different.
- 4 Q Well, it's in the -- it's connected to the
- 5 elevator, but it's --
- 6 A Yes.
- 7 Q It works differently?
- 8 A Yes.
- 9 Q And you indicated that you were responsible
- 10 for that investigation as the designated
- 11 NTSB member for Charlotte?
- 12 A Responsible's not the right word, probably.
- 13 Q Okay.
- 14 Why don't you --
- 15 A Because the IIC is responsible for the
- 16 investigation.
- 17 Q Right.
- 18 A The board member is responsible for
- 19 communications in a number of different
- 20 areas, and in a general sense to ensure that
- 21 the IIC has everything necessary to
- 22 accomplish the job.
- 23 Q Okay.
- 24 You went down to Charlotte once?

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- 1 A Correct.
- 2 Q Do you remember when that was?
- 3 A The very day of the accident. That happened
- 4 in the morning, and I believe we left
- 5 Washington, DC at noontime.
- 6 Q As part of the Go Team?
- 7 A As part of a Go Team.
- 8 Q And you stayed down there for three days?
- 9 A Roughly.
- 10 Q Following that, do you ever remember having
- 11 conversation with anybody from Raytheon
- 12 about any aspect of the Charlotte accident?
- 13 A Oh, yes.
- 14 Q Okay.
- 15 Who did you talk to?
- 16 A I think very early on, it was Mike Scheidt.
- 17 Q Do you remember what conversation you had
- 18 with him?
- 19 A It was just in a general sense about the
- 20 accident. I had -- I consider Mike Scheidt
- 21 to be a friend. We had developed a
- 22 relationship because of my work with
- 23 Raytheon around the accident at Quincy,
- 24 Illinois where when that accident

21 (Pages 78 to 81)

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1 investigation was presented to the board, I
2 had a feeling that there was some
inaccuracies in what was presented to the
4 board. I -- I never went to the scene. I
5 didn't participate in anything with the
6 Quincy, Illinois accident, but my gut told
7 me that there was -- there was some pieces
8 that weren't right.

9 I called out to Art Wagner, who I
10 knew from Washington, and asked him if I
11 could come out and look at an airplane and
12 look at some pieces of it.

13 It was during that visit that I've
14 come to know Mike and for whatever reason,
15 he and I hit it off very well together. I
16 considered him to be a -- a term that I
17 would call stand-up guy, and we got along,
18 we worked through that issue and made some
19 changes.

20 Q What were the changes that were made to the
21 report?

22 A Essentially, Beech was being impeached, I
23 guess, or blamed for the door, propensity
24 for that door to jam, and I was able to --

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1 to ascertain through my mechanical
2 experience that it could not have been the
3 door. It was not the door, and we ended up
4 getting the report changed somewhat.

5 And as a result of that, we had --
6 that work didn't take two minutes. That
7 work took a little time. We had
8 conversations together, he and I. In fact,
9 I actually think I have all his numbers, not
10 just work numbers, all his numbers, and I
11 should say had, past tense.

12 And then -- so we developed a
13 relationship, one that you could call
14 somebody up and not have to be necessarily
15 very formal.

16 Q Okay.

17 MR. BUNIS: Peter, can we just take a
18 break if you're done with that question? I
19 just want to consult with the witness for a
20 second.

21 (Recess.)

22 BY MR. KNIGHT:

23 Q Is it fair to say that you spoke to Mike
24 Scheidt a number of times after the

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1 Charlotte accident?

2 A Yes.

3 Q By telephone?

4 A Yes, or some --

5 Q In person?

6 A (Witness nods.)

7 Q Where else did you see him in person?

8 A In Washington.

9 Q At a meeting at the NTSB?

10 A Yes. More than once.

11 Q More than one meeting at the NTSB with Mike
12 Scheidt?

13 A More than one visit to me. I don't know --
14 I don't recall why he was in town.

15 Q Well, this was not a personal meeting?

16 A It was one that was personal as well.

17 Q You said there was more than one meeting at
18 the NTSB with Mike Scheidt?

19 A And by meeting, I mean he came by my office
20 on more than one occasion.

21 Q Okay.

22 Now, Mr. Scheidt obviously worked for
23 Raytheon. Do you know what his title was?

24 A No. When I was reading his deposition, I

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1 thought he was general counsel, but I didn't
2 see that in there. So I don't know what his
3 title was until he became president.

4 Q In any event, in connection with the
5 Charlotte accident and his meeting with you
6 at the NTSB, he was there in an official
7 capacity; is that right?

8 A At one time, yes.

9 Q Okay.

10 And you were discussing what subject
11 area?

12 A I think the official visit he was explaining
13 to me his coming to town to actually brief
14 us on the maintenance manual issues.

15 Q What were the maintenance manual issues?

16 A What the level of understanding, whether or
17 not the word constructions were adequate,
18 that --

19 These are going to be my words now --
20 I don't necessarily remember his -- but the
21 whole -- the whole reason why -- the whole
22 area around why people would be making
23 mistakes.

24 Q In the Charlotte accident, the probable

22 (Pages 82 to 85)

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1 cause focused on mistakes made by the
2 maintenance employees; is that correct?
3 A Mm-hmm.
4 Q And, as you say, it had to do with rigging
5 of the elevator?
6 A Yes.
7 Q Not the trim on the elevator, right?
8 A Right.
9 Q Have you exhausted your memory with respect
10 to any conversations you had with Mike
11 Scheidt following the Charlotte accident?
12 A No.
13 Q Okay.
14 Could you tell us whatever other
15 conversations you can recall?
16 A Yes, but they may not be in order. Okay?
17 He came -- we had a discussion, and
18 I'm not sure if -- it may have been over the
19 phone.
20 I know there was one in the office,
21 where he discovered somebody within his
22 organization that came from the military and
23 talked about validating manuals, and we
24 talked about how we got manuals that had

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1 procedures in them that weren't validated
2 and what that meant, and he -- and he and I
3 discussed about what he could do about that
4 or what he intended to do about it is maybe
5 a better word -- way of saying that.
6 And we've had -- we had more than one
7 discussion around that subject after
8 Charlotte and before Hyannis.
9 Q You say you had -- before the Charlotte
10 accident you had a conversation?
11 A After Charlotte, before Hyannis.
12 Q Do you remember when the conversation was
13 before Hyannis?
14 A No, I honestly can't say.
15 MR. BUNIS: Don't guess.
16 A Yes, okay.
17 Q Do you remember Mike Scheidt visiting you
18 with Dean Thompson?
19 A I remember him visiting with another
20 individual who I never could remember the
21 name.
22 Q You don't know Dean Thompson?
23 A He came with somebody. I don't know who he
24 is.

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1 Q Okay.
2 A chief accident investigator from
3 Raytheon?
4 A You know, if he introduced him to me that
5 way I would have remembered that. Maybe not
6 the name, but I would have remembered that.
7 I don't remember that.
8 Q Okay.
9 Do you remember meeting with Mike
10 Scheidt and another individual from
11 Raytheon?
12 A Yes, I did have a meeting.
13 Q Okay.
14 And when was that? Was that before
15 or after Hyannis?
16 A I can't be sure. I don't know.
17 Q Do you remember a meeting with you and Mike
18 Scheidt on or about December 10, 2003?
19 A In Washington?
20 Q Yes.
21 A I don't remember the date, but, like I said,
22 we had -- we had more than one meeting.
23 Q And were there -- do you recall at a meeting
24 in December that the subject of travel

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1 boards came up?
2 A Yes.
3 Q Do you remember when that discussion was?
4 A No, but I remember having that discussion
5 with him.
6 Q What's a travel board?
7 A It's a fixture that you can put onto the
8 airplane that makes it relatively easy to
9 see the travel that a -- flight control,
10 what is going up and down.
11 Q And see the degrees of deflection?
12 A Most of them are just marked in lines, so
13 they don't reference the degrees. It would
14 be a protractor that would give you the
15 actual degrees.
16 Q Mm-hmm.
17 A But it's a quick way when you're rigging an
18 airplane in particular that you can see
19 which direction it's going.
20 Q Do you remember whether or not another
21 member was present during a meeting when
22 travel boards were discussed?
23 Maybe I can suggest --
24 A Well, Dick Healing was around.

23 (Pages 86 to 89)

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<p>1 controls, elevators, ailerons, you should</p> <p>2 have a certain amount of --</p> <p>3 A Should be trained on --</p> <p>4 Q -- experience even past getting your A&P,</p> <p>5 right?</p> <p>6 A Yes.</p> <p>7 Well, the requirement -- you know,</p> <p>8 A&P is basic training. It's not the last</p> <p>9 piece of training. It's basic skill. It</p> <p>10 teaches you how to use the manual, teaches</p> <p>11 you how to think in aviation, so before you</p> <p>12 do anything else, you need to have</p> <p>13 additional training.</p> <p>14 Q Probably like anything, isn't it?</p> <p>15 A Mm-hmm.</p> <p>16 Q That is kind of a license, whether it's a</p> <p>17 law license or a medical license or a</p> <p>18 mechanic's license?</p> <p>19 A I was going to put the reference to law</p> <p>20 license in there, but I decided not to.</p> <p>21 Q Yes.</p> <p>22 Everybody gains from experience?</p> <p>23 A Yes.</p> <p>24 Q But to your knowledge, there is no</p>	<p>1 A I think --</p> <p>2 Q You do recall that?</p> <p>3 A I do recall that, yes.</p> <p>4 Q So that would have been -- this conversation</p> <p>5 we're talking about is probably in December?</p> <p>6 A Yes.</p> <p>7 Q And so going back to all the questions that</p> <p>8 I've asked you about your conversation with</p> <p>9 Mr. Scheidt with respect to the Class of</p> <p>10 '86, the minimum level of training for</p> <p>11 maintenance people to work on flight control</p> <p>12 systems, and experts that could help develop</p> <p>13 a maintenance manual, that all those</p> <p>14 conversations were probably in December of</p> <p>15 2003?</p> <p>16 MR. BUNIS: Objection.</p> <p>17 A Well --</p> <p>18 MR. BUNIS: You can answer the</p> <p>19 question if you understand it.</p> <p>20 A No, no, they were -- they were earlier.</p> <p>21 Q Well, certainly the one about the experts --</p> <p>22 A That was at that point, yes.</p> <p>23 Q That was December.</p> <p>24 A Right.</p>
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<p>1 manufacturer of any airplane has designated</p> <p>2 a certain level of experience before you can</p> <p>3 work on a particular area of the airplane;</p> <p>4 is that fair to say?</p> <p>5 A That's fair to say.</p> <p>6 Q But anyway, you had this discussion with</p> <p>7 Mr. Scheidt at some point?</p> <p>8 A Correct.</p> <p>9 Q Do you remember talking to Mr. Scheidt about</p> <p>10 industry experts who could help develop</p> <p>11 maintenance procedures?</p> <p>12 A In a general sense, I do.</p> <p>13 Q Did you indicate to Mr. Scheidt that you</p> <p>14 would provide those names to him?</p> <p>15 Maybe I could refresh your</p> <p>16 recollection here.</p> <p>17 A Yes, I don't remember.</p> <p>18 Q Do you recall advising Mr. Scheidt that you</p> <p>19 would give him the names of true industry</p> <p>20 experts in the development of maintenance</p> <p>21 procedures, but he would have to call you</p> <p>22 every day beginning Monday, December 15, to</p> <p>23 make sure he gets the names, anything like</p> <p>24 that?</p>	<p>1 Q Did you ever give him the names?</p> <p>2 A I honestly don't remember.</p> <p>3 Q During -- during this visit in December, do</p> <p>4 you recall telling him that you had actually</p> <p>5 gone to Hyannis and talked to some of the</p> <p>6 mechanics there?</p> <p>7 A I don't remember saying that, but I did</p> <p>8 that.</p> <p>9 Q When did you go to Hyannis?</p> <p>10 A I went to Hyannis while the on-scene was</p> <p>11 still going on, but at the very end; so I</p> <p>12 don't know how many days I spent down there,</p> <p>13 but it was at the very end of it.</p> <p>14 And then I went a couple of times</p> <p>15 after that.</p> <p>16 Q Yes.</p> <p>17 What -- the next time you went to</p> <p>18 Hyannis, what was the purpose of that visit?</p> <p>19 A To look at rigging of the airplane, what</p> <p>20 they did.</p> <p>21 Q Are you talking about wreckage?</p> <p>22 A No, I'm talking about in the hangar.</p> <p>23 Q So you took apart another airplane, another</p> <p>24 1900?</p>

25 (Pages 94 to 97)

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1 A I did not take apart. I watched them.
 2 Q Okay.
 3 A They let me know when they were -- Colgan
 4 let me know when they were going to do
 5 Detail 6, I think it was, whatever the check
 6 was, and I watched them, what they did.
 7 Q So somebody from Colgan called you and told
 8 you that they were going to do this?
 9 A I called them and asked permission to come
 10 visit them, and they said they would let me
 11 know when they were going to be doing work,
 12 similar work, maybe not -- and it wasn't
 13 replacing that cable, just --
 14 Q But it --
 15 You went to Hyannis?
 16 A I went to Hyannis.
 17 Q Did you speak with Mike Colgan?
 18 A I have. I don't know if I did during this
 19 or not.
 20 Q Okay.
 21 Anyway, you called and asked if you
 22 could visit and see this?
 23 A Yes.
 24 Q And this was not a personal request, this

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1 was NTSB?
 2 A Well, it's tough to separate personal from
 3 the NTSB.
 4 Q Well, when you called, you said this is John
 5 Goglia --
 6 A Yes.
 7 Q -- from the NTSB calling?
 8 A They knew who I was.
 9 Q Right.
 10 And they obviously agreed to allow
 11 you to see that?
 12 A Mm-hmm.
 13 Q And you went and you looked at it, right?
 14 A Yes.
 15 Q And what did they do while you were there?
 16 A They were doing their normal routine.
 17 Q Yes.
 18 A Nothing different. And I was just watching
 19 how they worked, and --
 20 Q Okay.
 21 A -- nothing special was done. We didn't take
 22 anything apart.
 23 Q All right.
 24 And when is the next time you went to

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1 Hyannis?
 2 A Sometime after that, very similar
 3 circumstances.
 4 Q What do you mean by that, similar
 5 circumstances?
 6 A Just going down to see them do another
 7 check.
 8 Q Oh, it was another Detail 6 check?
 9 A I think so. I'm not 100 percent sure of
 10 that, but I think so.
 11 Q So you saw the same thing twice?
 12 A Yes.
 13 Q Why would you want to do that?
 14 A Because I know that you need to look at
 15 things more than once sometimes to get a
 16 feel for them.
 17 Actually, I think I did it again yet
 18 a third time. It was at least twice. May
 19 have been a third time.
 20 Q Do you recall in this meeting in December of
 21 2003 that -- telling Mr. Scheidt that you
 22 were disappointed during a visit at Colgan
 23 in Hyannis to hear mechanics and inspectors
 24 arguing about the proper method of

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1 installing flight control rig pins?
 2 A Yes.
 3 Q And do you recall stating to Mr. Scheidt
 4 words to the effect that they still don't
 5 know what they're doing?
 6 A No, I don't recall saying that.
 7 Q What did you say?
 8 A Well, I shared with him the experience of
 9 the folks trying to follow the manual for
 10 rigging the elevator, and when it came time
 11 to insert the rig pin at the rear up on the
 12 tail of the airplane, two of the most senior
 13 people there disagreed on which way the rig
 14 pin should be installed. In the manual, it
 15 was not clear in explaining which way the
 16 rig pin should be installed, so I felt that
 17 was a noteworthy item.
 18 Q So what did they do?
 19 A Since it wasn't a real job at that point,
 20 they were -- I was asking them about steps
 21 in it. They didn't have to do anything, so
 22 just left it there, just said forget it.
 23 Q Do you recall what they eventually did?
 24 A No.

26 (Pages 98 to 101)

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1 Q Cal I Raytheon?

2 A Probably.

I'll tell you, the Raytheon phone

number was known by every one of those guys there without having to look it up, because I asked that -- that came up during the course of what we just said, and I noted that they could rattle the phone number off, and that told me that these guys are calling all the time.

Q As far as maintenance practices, it's fair to say that whenever you as a maintenance -- as a -- as a maintenance mechanic had any question or any doubt about a procedure, the correct thing to do is to stop?

A Correct.

Q The correct thing to do is to stop and either call a supervisor, somebody with more knowledge, more experience, or call Raytheon; fair to say?

A Or the manufacturer.

Q Well --

A You need to -- if you don't know, you need to stop.

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1 Q You need to stop?

2 A You need to stop and get further guidance.

We now know that may not always be the best practice in how you handle that, but that is what you're supposed to do, yes.

Q That is the best practice, isn't it, to stop?

A To stop is the best practice. After the stop is when you get in trouble.

Q Okay.

But stop if there's any doubt whatsoever.

A Stop, yes.

Q It's one of the first rules of maintenance, right?

A You're taught that right in the beginning in A&P school.

Q Do you recall any other conversations with Raytheon employees after the Charlotte accident but before Hyannis that you haven't told us about?

A None that I recall, because the number of folks that I know from Raytheon is very limited from the Beech Aviation side.

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1 Q Okay.

So then the Hyannis accident occurred on August --

A 26th.

Q 26th. and you've told us you went to the scene that day?

A No.

Q The next day, three --

A The on-scene investigations typically go three to five days. I don't remember how long this one went, but it just so happened that when I went down there, they were finishing the on-scene.

Q So you were there within --

A Within five days.

Q Yes.

And then you went back to Hyannis, I think you told us, two or three our times to look at Colgan maintenance personnel doing --

A Work.

Q -- work on rigging, right, or an inspection?

A Inspection, yes.

Q And did you ever participate in a simulation

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of misrigging a Beech 1900 for its elevator trim?

A No, I don't believe so.

Q You've never seen what happens when a Beech 1900 is misrigged in its elevator trim?

MR. BUNIS: Objection. Objection.

Q Okay.

A I'm a little bit confused over that question, so maybe you can clarify it a little bit.

Q Well --

(Pause.)

Q Did you ever go to -- have you ever been to Wichita other than in June of this past year?

A Yes.

Q And did you ever go to Wichita in connection with either the Charlotte accident or the Hyannis accident?

A Other than the one you and I went together.

Q That was June?

A Other than June.

Q Other than June?

A No.

27 (Pages 102 to 105)

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1 Q And this misrigging information had to do
2 with the elevator trim system?

A Yes.

4 Q Okay.

5 When did you first review that
6 information?

7 A I don't remember, but it wasn't that long
8 ago.

9 Q Well, at some point in the fall of 2003, you
10 suspected that the 1900 that crashed in
11 Hyannis was misrigged in its elevator trim
12 system?

13 A Yes, well, the -- right.

14 Q Right.

15 And you had to have been aware that
16 there was going to be a misrigging
17 demonstration in Wichita to determine what
18 would happen if it's misrigged in certain
19 ways?

20 A I was probably aware that they were going to
21 do some follow-on activity. Just what that
22 was, I -- I would say that I probably wasn't
23 involved with that and knew in advance of
24 that, but I would expect that they would

1 A Yes, but the real focus for my -- for going
2 to Hyannis was actually follow-on to the
3 talk that -- work that -- discussions with
4 Mike Scheidt, the process.

5 I wasn't as much concerned about the
6 process of accomplishing maintenance as I
7 was with the actual mistake, because the
8 mistake has already happened. I can't
9 change that.

10 Q Right.

11 A But if I can identify problems in the
12 process, I can stop anything from happening
13 in the future, so I'm being driven in there
14 to find out why did otherwise good people
15 make a mistake.

16 Q And at some point, your attention was drawn
17 to the maintenance manual and a figure in
18 the maintenance manual regarding the drum
19 upon which the cable is wrapped that
20 operates the elevator trim system; is that
21 correct?

22 A Yes, that was before the visits.

23 Q Before your visits?

24 A Yes.

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1 have done that.

2 Q Yes.

3 You wouldn't -- you didn't go to it?

4 A Correct.

5 Q But it was certainly important to that
6 investigation?

7 A Yes.

8 Q And the probable cause of the Hyannis
9 accident referenced the misrigging of the
10 elevator trim system?

11 A Yes.

12 Q There was -- did you ever determine how the
13 elevator trim system was misrigged? Did
14 you --

15 A Personally? Me personally?

16 Q Yes.

17 A No.

18 Q You don't remember --

19 A No.

20 Q Well, you went two or three times to Hyannis
21 to watch them working on the inspection?

22 A Right.

23 Q So you were fairly familiar with the manner
24 in which the trim estimate operated?

1 Q You knew that was the focus --

2 A Right, of the investigation. And, in fact,
3 I think Mike Scheidt and I actually talked
4 about that at one point.

5 Q That it was miswrapped?

6 A (Witness nods.)

7 Q Yes?

8 A That there was a problem.

9 Q Okay.

10 A That there was a problem with it. At that
11 point in time, I'm not sure that I knew that
12 it was miswrapped or installed backwards,
13 because there was lots of confusion around
14 that.

15 I just knew that the process was
16 disconnecting.

17 Q But having reviewed the work done on
18 misrigging out at Wichita, I take it you had
19 to have known that the -- in order to do
20 what the maintenance people did in this
21 case, they had to not only miswrap the drum
22 but cross the wires, cross the cables?

23 A They have them crossed someplace, yes.

24 Q They had to do that independently of the

29 (Pages 110 to 113)

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1 airplane is built. They use engineering and
2 assembly drawings to create them. And then,
3 like you say, they run through the
4 validation process, which is all done in an
5 office some place.

6 If you're not out there actually
7 accomplishing the task step by step looking
8 at the paperwork, you cannot be certain that
9 it's accurate.

10 Q Well, even with the validation process, some
11 procedures may still contain an inaccuracy,
12 true?

13 A Human nature being what it is, I would agree
14 with that, but it would be considerably
15 less.

16 Q Okay.

17 So with the validation that you're
18 talking about, which you referred to as the
19 super-find that was discussed with Mike
20 Scheidt, how is that any different from the
21 validation procedure that was involved with
22 the procedure of the Beech 1900 that was
23 involved in the actual accident aircraft,
24 which was built in 1993?

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A The -- I'll base this only on the
2 discussions that I had with Mike Scheidt.

3 What I left with, the takeaway from
4 those discussions was the fact that these
5 procedures were not validated.

6 Q You don't think the procedures ever went
7 through the vetting process when they were
8 first drafted?

9 A Not vetting. Validation. I'm reading what
10 you said to me as validation, meaning
11 someone that did it while we were watching
12 it.

13 My conversations with Mike led me to
14 believe that that didn't take place.

15 Q Well --

16 A Vetting -- vetting, I'm sure, did take
17 place.

18 Q Let me ask you this:

19 You don't know -- the procedure that
20 was involved for the elevator trim system
21 involved in the accident aircraft, you don't
22 know how it was drafted or under what
23 circumstances; is that fair to say?

24 A That is correct.

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1 Q And you don't know to what extent there was
2 any vetting or consultation with either
3 maintenance or engineering or any other
4 discipline?

5 A Correct.

6 Q All right.

7 All you know is your opinion is that
8 there's an error in it; is that correct?

9 A That's correct.

10 Q All right.

11 And even with the validation process
12 that you've discussed, you can't avoid all
13 errors reasonably?

14 A One hundred percent certainty, no.

15 Q Human nature being what it is?

16 A But you should be able to eliminate most.

17 Q Okay.

18 MR. BUNIS: Two-minute break?
19 One-minute break?

20 MR. KNIGHT: Huh?

21 MR. BUNIS: Can I take a one-minute
22 break?

23 MR. KNIGHT: Sure.

24 MR. BUNIS: Be right back.

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1 (Recess.)

2 BY MR. KNIGHT:

3 Q There is no product, airplane, that can be
4 accident-proof?

5 A That's correct.

6 Q Human nature being what it is, there is no
7 manual that can be 100 percent accurate?

8 A That might be a little too strong, but, yes.

9 Q In working with Mike Scheidt following
10 Charlotte and following Hyannis, you
11 understood that Raytheon was attempting to
12 improve the manual; is that correct?

13 A That's correct.

14 Q And you've talked about discussions that
15 you've had with Mike Scheidt, not all that
16 you can remember, but some of which you've
17 testified about, leading up to a
18 conversation in December of 2003, right?

19 A Yes.

20 Q And how about after 2003, did you have any
21 further conversations with Mr. Scheidt?

22 A I don't know, I -- I don't remember.

23 Q All right.

24 The probable cause was determined

35 (Pages 134 to 137)

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1 A Yes.
 2 Q So Exhibit 3 lists all the depositions, experts and so forth, right?
 4 A Mm-hmm, yes.
 5 Q One of the Raytheon experts is Dwight Law.
 6 Do you know him?
 7 A No.
 8 Q Never heard of him?
 9 A No.
 10 Q Okay.
 11 What about an expert by the name of
 12 Vallerand, Don Vallerand? Do you know who
 13 Don Vallerand is?
 14 A Is he the A&P instructor?
 15 Q Yes.
 16 A Okay. I don't know him. I just remember
 17 reading his --
 18 Q From counsel or --
 19 A No, it's on the disk.
 20 Q On the disk? Which disk?
 21 A Did he not testify, give expert testimony
 22 someplace?
 23 Q Not yet.
 24 A There's a deposition for him.

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He's the guy that lives in
 2 Tyngsborough, Massachusetts?
 3 Q Yes.
 4 A Yes, there's a deposition for him.
 5 Q You've read his deposition?
 6 A I have.
 7 Q What -- what did it involve?
 8 A He talks about -- he was asked questions
 9 around A&P schools and mechanics, what they
 10 teach in school.
 11 Q Oh, you may be talking about his expert
 12 report as opposed to deposition?
 13 A Oh, yes -- well, maybe that's what it is.
 14 Q Okay.
 15 So do you know who he is?
 16 A No.
 17 Q Not familiar with him?
 18 A No. We went to the same school but
 19 different times.
 20 Q All right.
 21 Dick Nelson, do you know who he is?
 22 A No.
 23 Q Any of the experts listed by Raytheon, are
 24 you familiar with any of them?

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1 A None. Mike Scheidt.
 2 Q Yes, okay.
 3 Now, the documents that you have
 4 referred to included the full NTSB report?
 5 A That's correct.
 6 Q And particularly the report on probable
 7 cause; is that right?
 8 A I read the probable cause once, but I
 9 didn't -- early on, and never went back to
 10 it.
 11 I really wasn't interested in the
 12 probable cause.
 13 (Exhibit No. 10 marked for
 14 identification.)
 15 BY MR. KNIGHT:
 16 Q Probable cause states in part, anyway -- it
 17 says the National Transportation Safety
 18 Board determines the probable causes of this
 19 accident as follows:
 20 "The improper placement of the
 21 forward elevator trim cable and subsequent
 22 inadequate functional check of the
 23 maintenance performed which resulted in a
 24 reversal of the elevator trim system and a

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1 loss of control in flight. Factors were the
 2 flight crew's failure to follow the
 3 checklist procedures and the aircraft
 4 manufacturer's erroneous depiction of the
 5 elevator trim drum in the maintenance
 6 manual."
 7 MR. BUNIS: Do you see that?
 8 Q Was that fairly read?
 9 A Yes.
 10 Q All right.
 11 Do you agree with that?
 12 A Do I agree with that?
 13 Q Yes.
 14 A Am I through --
 15 Q Yes.
 16 A little while ago I asked you if you
 17 knew how many -- having reviewed all this
 18 material, if you knew how many cables were
 19 sold to repair the elevator trim system
 20 prior to this accident, and you indicated
 21 you had no idea?
 22 A Correct.
 23 Q Okay.
 24 The number of cables sold or the

37 (Pages 142 to 145)

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- 1 Q And you've seen the analysis of this thing.
 2 A Yes.
 3 Q They did nothing but increase airspeed?
 4 A Yes.
 5 Q When they already had adequate airspeed to
 fly the airplane, right?
 7 A Right.
 8 Q Well, what was the maneuvering speed of this
 9 airplane; do you know?
 10 A No, I don't know.
 11 Q Well, certainly brought it from 170 knots.
 12 It was climbing out to well over 200, by
 13 increasing that speed, by taking off the
 14 flaps and the landing gear?
 15 A Right, and he's calling, Pull, pull up, pull
 16 up, pull with me.
 17 Q So you don't have any thoughts or opinions
 18 about that, except that you know it's
 19 absolutely the wrong thing to do?
 20 A Especially now in hindsight. I'm a good
 21 Monday morning quarterback.
 22 Q But you know from having flown with trim
 23 that's out of trim that the faster you go,
 24 the worse it gets?

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- A Yes.
 2 Q So all you need to do is slow down, and it
 3 gets a lot easier, right?
 4 A Right.
 5 Q Do you have any explanation for that?
 6 A No.
 7 Q Well --
 8 A Except maybe -- I can't say that.
 9 I was going to say the anxiety level
 10 is going up pretty fast, so --
 11 Q Root cause analysis might look into why the
 12 pilots made some incorrect decisions, right?
 13 A Yes, and that's exactly the same --
 14 Q And root cause analysis might also look into
 15 why so many mechanics on this airplane made
 16 so many bad decisions, right?
 17 A Correct, correct.
 18 Q Now, getting to your opinion, if we could.
 19 It is Exhibit 3?
 20 A I've got it, yes.
 21 Q On the third paragraph, you're -- you state
 22 that the opinion is based on reviewing the
 23 attached list?
 24 A Mm-hmm.

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- 1 Q And inspection of the wreckage, which you
 2 did, I think, five days after as a member of
 3 the NTSB, right?
 4 A Correct.
 5 MR. ELBERG: I'm sorry, what page are
 6 we on?
 7 A Third. I'm answering questions for you.
 8 Q Onsite visits to the maintenance facility at
 9 Colgan Air, that's what you talked about?
 10 A Yes.
 11 Q Those are in connection with your
 12 responsibilities for the NTSB, right?
 13 A Mm-hmm.
 14 Q The inspection of the 1900 Raytheon
 15 aircraft -- the inspection of 1900 Raytheon
 16 aircraft in Wichita, that was in June 2006,
 17 right?
 18 A Yes, I think so.
 19 Q And you're also basing it on your service as
 20 the NTSB board member on scene January --
 21 A '03.
 22 Q -- '03, as well as what you learned, I take
 23 it, in connection with your investigation in
 24 the Hyannis crash, personal information,

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- 1 right?
 2 A Yes.
 3 Q That you learned in connection with your
 4 official investigation?
 5 A Hyannis officially I didn't have a lot to do
 6 with.
 7 Q You went there three times?
 8 A Right. But it really isn't part of what
 9 ends up in that paper, the probable cause
 10 that you showed me.
 11 Q You left the NTSB --
 12 A No.
 13 I was still at the board, but what I
 14 observed did not become part of that record,
 15 if you will. It was part of --
 16 Q It became part of the investigation, though?
 17 A No, it didn't.
 18 I did not go back to the NTSB and
 19 say -- write out a report or even verbally
 20 say to somebody I visited the hangar last
 21 night and I observed the following. That's
 22 not how it works.
 23 Q I understand.
 24 But you did it anyway?

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1 A I did.
 2 Q And you were working -- until you left, you
 3 were working on that investigation?
 4 A You're going to have to help me out here and
 5 say what working means. I didn't touch it.
 Q There were designated experts in certain
 / fields, but --
 8 A In fact, I can tell you after the first of
 9 the year, I probably did nothing with this.
 10 Q Okay.
 11 But you had already spoken to Mike
 12 Scheidt and somebody else from Raytheon?
 13 A Yes.
 14 Q As an official NTSB board member?
 15 A Right.
 16 Q About the Hyannis crash?
 17 A Yes.
 18 Q Okay?
 19 A Yes.
 20 Q Okay.
 21 Now, when you went out to Raytheon in
 22 Wichita this last June, apparently you
 23 learned something, because you're basing
 24 your opinion in part on that inspection.

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1 What was it that you learned?
 2 A Clarification of cable runs, of adjustment
 3 points, sat in the cockpit, moved the
 4 control column, played with the trim, cable
 5 routings under the pedestal, up in the nose
 6 when we stuck our head up in there, looked
 7 at what was going on.
 8 That's -- clarification of all the
 9 runs and looking at what needed to be
 10 accomplished.
 11 The seat was out -- in Hyannis, I
 12 never got down on the floor and underneath
 13 the pedestal and did any of that.
 14 I could see some of it, because I had
 15 the seat out, but this time I got down and
 16 looked.
 17 Q Going to the final paragraph, page 1 of your
 18 report, you say that instrument -- an
 19 instrument flight-plan rules flight plan was
 20 filed for reposition flight conducted under
 21 14 CFR Part 91.
 22 What is the significance to it
 23 being -- that flight being a Part 91 flight
 24 as opposed to a 121 flight in terms of your

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1 opinion that you've advanced in this case?
 2 A I didn't really look at that. This is just
 3 an observation.
 4 Q So --
 5 A The fact that it was a ferry flight, the
 6 significance there is that it's under a less
 7 stringent set of rules.
 8 Q Rules as far as what?
 9 A Almost across the board. Not so much in the
 10 flight -- from the pilot's point of view but
 11 from the maintenance point of view.
 12 Q What's the difference from maintenance?
 13 A Well, maintenance elevates. Part 91 I guess
 14 could be called basic maintenance.
 15 And as you move up through 135, the
 16 requirements grow. When you get to 135-10
 17 or more, the requirements grow even further;
 18 and when you get up to 121, you're at the
 19 top of the -- what industry may call the
 20 burden of --
 21 Q The expectation of competency of maintenance
 22 personnel doesn't change?
 23 A No.
 24 Q So no matter what the flight rule is being

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1 conducted under, the expectation of the NTSB
 2 or the FAA or of a manufacturer would not
 3 change, right?
 4 They expect -- you have to answer
 5 audibly.
 6 A Yes, there is expectation from above and
 7 down, which is the way you just said it, and
 8 there is expectation from below up as well.
 9 Q Okay.
 10 But in terms of the competence of
 11 maintenance personnel, that doesn't change
 12 no matter how the flight is being conducted?
 13 A That's correct.
 14 Q And the rules that we were talking about of
 15 when in doubt, stop, or follow the manual,
 16 or do an operational check, those rules
 17 don't change whether it's a Part 91, Part
 18 121 or 135 flight, is it? Is that correct?
 19 A That's correct.
 20 But I would like to make one
 21 clarification on what you said. You -- when
 22 you got to the part that said operational
 23 check, there are many different types of
 24 operational checks.

53 (Pages 206 to 209)

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1 A We're talking about maintenance.

2 Q Maintenance, yes.

3 And, again, if they didn't understand
4 it, they should check before they proceed,
5 right?

A They should check, but where would you --
where do you go --

8 See, that's the other piece that's
9 not said here. To get the instructions that
10 you need -- we're not -- there's not an
11 orderly flow through the sections in the
12 manual. In fact, Crow mentions that in his
13 testimony, and he viewed that as
14 dumbing-down the job.

15 But you don't dumb the job down. In
16 fact, everybody is rewriting their manuals
17 now because we're using up to 45 repair
18 stations which are made up predominantly of
19 noncertificated people, so we have to
20 rewrite all our manuals.

21 Q But certainly all trim wheels work the same
22 way.

23 When you push them forward, you're
24 going nose-down?

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1 A Yes.

2 Q You go aft, wheel it aft, then it's -- then
3 it's tail-down?

4 A You and I as pilots understand that.

5 Q Maintenance people understand that.
6 Everybody understands it.

7 If you're working on a manual trim
8 wheel, you have to understand that, right?

9 A I agree.

10 Q And Raytheon would be reasonable in
11 expecting that people understand that,
12 right?

13 A Yes.

14 Q So how is it that the maintenance people --
15 if the wheel says aft as opposed to, you
16 know, tail-down or nose-up, how would they
17 possibly confuse that?

18 A They're probably looking at that time, and
19 if he looked inside the window to see what
20 the electric trim indicator is, I mean, they
21 would just -- they would start getting
22 this -- is it tab up, tab down?

23 You could lead yourself in all sorts
24 of places. So if you're not --

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1 Q That's not referring to the tab?

2 A No, but now they're going to add that to it.
3 Because why are they moving that trim
4 system? Because somebody is back there
5 checking the tab, so now you've entered a --

6 Q You're right.

7 They may not coordinate what they're
8 actually doing between the two of them, but
9 you cannot fault Raytheon for that lack of
10 coordination between the two of them?

11 A No, I don't fault Raytheon for that. I
12 fault Raytheon for not having the proper
13 reference to send them into the full rigging
14 check in the manual.

15 Q Which they should know anyway?

16 A They should know that they need to do a full
17 check. They shouldn't know where to find
18 it.

19 Q No, but they should know how to do it
20 anyway?

21 A Not a memory item. It's not a memory item.
22 You need to have the checklist.

23 Unlike pilots, you know, this is --
24 my shot back at you, unlike pilots,

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1 mechanics don't have memory items.

2 The authority to do maintenance on an
3 airplane in a 121 environment comes from the
4 maintenance manual or from the engineering
5 department.

6 We don't do memory items. When we
7 do, we get in trouble.

8 Q In the next paragraph, you're talking about
9 the figure, I believe, which we've got
10 marked at least in part --

11 A Yes, that's it.

12 Q At least comes out of another document, but
13 we have the figure depicted here, do we not,
14 on Goglia 11?

15 A Yes.

16 Q And you say it showed -- it also showed the
17 nose-down cable coming from the forward end
18 of the drum rather than the aft. These
19 errors were the cause of this crash?

20 A Mm-hmm.

21 Q There were other things that certainly
22 caused the crash, weren't there?

23 A Well, there are a chain of events where it
24 starts.

69 (Pages 270 to 273)

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1 Q When you say "these errors were the cause of
2 this crash," perhaps you'd like to modify
3 that statement?

4 It was a factor?

5 A I can say that it was a factor. It was
6 probably one of the leading ones, but it was
7 a factor. You're going to make me rewrite a
8 probable cause contributing to this?

9 Q Well, the probable cause, actually -- it
10 stated what the probable cause was.

11 And then it said, "Factors were the
12 flight crew's failure to follow the
13 checklist procedures and the aircraft
14 manufacturer's erroneous depiction of the
15 elevated trim drum in the maintenance
16 manual," right?

17 A Right.

18 Q But the cause was really maintenance, what
19 the maintenance people did?

20 A It's --

21 MR. ELBERG: Object.

22 A It's a collective maintenance failure.

23 Q They didn't do the operational check, most
24 important?

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A Properly, didn't do it properly.

Q You could add up the number of errors made
by maintenance, and you probably --

A More.

Q -- five or more errors done by maintenance
that really caused this crash?

A (Witness nods.)

Q In your -- the next sentence or two, you
say, "The erroneous drawing could and did
cause the mechanic to misroute the cable
around the drum."

But, again -- and I think I've
already asked you about this -- they had to
have made the next error, which was crossing
the cables, in order to do this?

A Right, to get it to line up.

Q But you didn't mention that next error in
your report, did you?

A I don't believe I did.

Q And they have tagged, according to what you
said in the report and the deposition
testimony, they tagged the cables with tape?

A Mm-hmm.

Q And they still misrouted them?

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1 A They may have routed them right up to the
2 end.

3 Remember I mentioned to you about
4 going to the -- going down there to look at
5 where they crossed them, trying to determine
6 where they crossed them?

7 Q Yes.

8 A They may have -- they may have crossed them
9 right there at the end, although there's
10 some feeling that that's not the case. But
11 it's all -- it just depends on who looks at
12 it.

13 Q But they had to have crossed them?

14 A They crossed somewhere.

15 Q So even with this tape that they used, it
16 clearly was an inadequate method to ensure
17 that you didn't cross them. They crossed
18 them?

19 A Right, they crossed them.

20 And that gets to the instructions in
21 the maintenance manual not being detailed
22 enough to mitigate all the possible mistakes
23 that people make.

24 Q Well, you can't write a manual that will

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1 have all the possible mistakes that somebody
2 might make?

3 A I would say that you can in the areas that
4 are critical to flight. I wouldn't want a
5 manual, you know -- we don't want -- a
6 coffee maker is not going to bring an
7 airplane down, but flight controls certainly
8 are.

9 So you want to make sure that your
10 instructions are as detailed as they humanly
11 possibly can be and as clear and concise as
12 you can make them.

13 Q Okay.

14 But the more things you say in a
15 manual, the less likely that it will be read
16 and understood?

17 A Today, I think I might agree with that.

18 Q So if you tried to foresee every possible
19 mistake that somebody might make, you're
20 going to have much too much language in
21 order to ensure that they properly
22 understand the basic steps to carry out the
23 procedure; isn't that true?

24 A Well, routinely across the board, I would

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1 and one of your experts talks about this as
2 well -- where -- and I was really shocked
3 and appalled to read this from somebody from
4 Raytheon, but where they write the manuals
5 and send them out, and I'm -- these manuals
6 have now gone through all that verification
7 process you talked about, engineering
8 sign-off and all that stuff, they send them
9 out knowing that there's problems with them
10 and they expect the mechanics to call back
11 so they can correct them.

12 That's in a deposition, and I
13 couldn't believe that this individual said
14 that.

15 Q Do you know who said that?
16 (Pause.)

17 A No, but I can narrow it down a little bit.
18 It could have been Crow, could have been
19 Nelson, and there's one other guy in the
20 middle of this...

21 Q Well, let me ask you this:
22 And you may have said this before,
23 but certainly with any manufacturer who
24 designs and produces an airplane, part of

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1 that is producing the maintenance manual,
2 right?

3 A Right, 2150, I believe it is.

4 Q And undoubtedly, there are going to be some
5 errors in that as when it's first drafted?

6 A Mm-hmm.

7 Q And customers will advise of errors or other
8 people will advise the company of errors,
9 and corrections will be made over a period
10 of time, right?

11 A Yes.

12 Q And the less frequently used areas of the
13 manual will be less likely to be subject of
14 any comment or criticism over a period of
15 time, right?

16 A Yes.

17 Q So where you say here, "Finding their
18 mistakes only after fatal crashes is clearly
19 contrary to Raytheon's airworthiness
20 requirement," you're simply saying that the
21 maintenance manual and the airplane should
22 be reasonably safe for what they're
23 intended, right?

24 A And the -- in the sense we're talking about

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1 manuals at this point.

2 Q Right.

3 A The manuals should be accurate.

4 Now, I would not criticize anybody
5 if, again, the coffee maker manual had
6 deficiencies in it.

7 Q Right?

8 A But certainly flight controls, landing gear,
9 propeller require the utmost care not only
10 after the airplane is in service by guys
11 like me but also before we get it by guys
12 like Raytheon to make sure that what they
13 tell me to do is accurate.

14 So I would expect there to be many,
15 many less findings of problems in Chapter 27
16 in a manual, which is flight controls, than
17 I would in Chapter, you know, 32. No,
18 that's landing gear. I wanted to say
19 lights. I wanted to say lights. 21, air
20 conditioning. You know, less writeups in
21 the critical systems than --

22 Q There are a number of systems, though, are
23 certainly critical to flight, right?

24 A Yes.

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1 Q Pressure systems, right?

2 A Well, pressurization -- yes, yes.

3 Q And on and on?

4 A Right.

5 Q I mean, this is not -- it's not coffee
6 makers versus flight controls.

7 There are many, many other very
8 critical systems on board an airplane?

9 A Yes, and we need -- and we need to have
10 instructions on how to maintain them of
11 that -- the detail in them and written to
12 the level that they are understood by the
13 person that we expect to do the work.

14 Q The -- when you say, "After the Charlotte
15 crash" -- this is the next paragraph.

16 A The last paragraph?

17 Q Yes.

18 "After the fatal crash of the Beech
19 1900 in January 2003, a Raytheon
20 representative told me he was shocked to
21 find out that Raytheon did not validate
22 their procedures."

23 Who was that that you spoke to?

24 A That was Mike Scheidt.

72 (Pages 282 to 285)

EPPLEY COURT REPORTING

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